UNDERSTANDING FACTORS RELATED TO SURVIVING A DISASTER: 
THE SURVIVAL ATTITUDE SCALE

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ABSTRACT

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Survivor characteristics, including psychological attributes that may increase an individual’s chances of survival, have been the subject of various disaster response theories and have received attention in many survival handbooks. The present study examines psychological characteristics that have been attributed to an increased probability of survival during an active crisis event using a sample of 401 adults living in the United States. Existing literature on the psychology of survival from a variety of disciplines was used to develop a 15 item self-report measure of survival attitude, the Survival Attitude Scale (SAS), and to examine its psychometric properties and psychological and behavioral correlates. The SAS yields three dimensions of survival attitude (confidence in response, relinquishing control to others, and self-preservation). It also evidences acceptable reliability and construct validity when compared to measures of decision-making, reaction to threat, self-reported optimism, self-esteem and social desirability. To establish criterion validity for the measure, participants’ scores on the SAS were compared to overall performance on a short vignette depicting an active shooter situation on a university campus. In predicting scores on the Survival Response Strategies Vignette, scores on the SAS contributed to between 2% and 6% of the variation in survival response strategy scores beyond that of demographic factors (age, gender, religious affiliation), previous disaster experience, and scores on measures of decision-making ability, previous trauma, and personality characteristics. Scores on the SAS and the Connor-Davidson Resilience scale were moderately positively correlated, but overall, SAS scores were better predictors of scores on a vignette of survival response strategies than were scores on the Connor-Davidson Resilience scale. Although
preliminary, present findings provide insights into relevant factors related to survival response strategies for future research, including decision making, personality variables, and survival attitude, which may be useful in training citizens, first responders, and military personnel in survival response during an emergency.
Dedicated to:

My dad

Duane A. Fogo

(1959 – 2014)

Death changes everything; time changes nothing.

I still miss the sound of your laugh, your excitement at bad sci-fi movies, and your love for all things chocolate. Thank you for teaching me the value of hard work, to always do the right thing, the importance of laughter, and so much more.

You are missed every single day.

“So much of me is made from what I learned from you,

you’ll be with me like a handprint on my heart.”

- from Wicked, Stephen Schwartz
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INTRODUCTION AND LITERATURE REVIEW

When shots rang out on the evening of October 1st, 2017, the United States experienced its most deadly mass shooting to date. The location was the Route 91 Harvest Musical Festival in Las Vegas, Nevada. After it was all over, 58 people had tragically lost their lives and 546 people had been injured. The second most deadly US shooting occurred less than a year earlier at Pulse nightclub on June 12, 2016, with 49 deaths and 58 injuries. Tragically, the next three most deadly mass shootings in United States history all occurred at schools or universities: the 1927 Bath school disaster in which 44 people were killed, the 2007 Virginia Tech attack in which 32 individuals lost their lives, and the 2014 elementary school shooting at Sandy Hook in which a total of 27 children and teachers died. Four of these five shooting events occurred in the last ten years.

The three most recent shooting events, all occurring within the last three years and together totaling 134 deaths, received a substantial amount of media attention. Smaller incidents occur more frequently but are less well known. Depending on the resource, the number of people killed in mass shootings in 2015 was between 46 and 400 (Follman, Aronsen, & Pan, 2016; Gun Violence Archive, 2016). The wide variation in reporting primarily stems from disagreements about definitions of “mass shootings.” Differences in reporting also impacts determinations of whether or not mass shootings are on the rise in the United States.

The Federal Bureau of Investigation (FBI) revised their definitions of mass killing events in 2013 as a result of the Sandy Hook tragedy that occurred in December 2012. The FBI now defines a “mass killing” as the death of three or more people in a single incident (Federal Bureau of Investigation [FBI], Active Shooter Incidents). The FBI definition does not include the death of the perpetrator(s) in the determination of whether the event is a “mass event.” Although a “mass event” is defined without regard to the type of weapon used, the term “mass shooting” is
used when a gun is involved in the event. At the time the event is taking place, it is known as an “active shooter” event. Prior to the 2013 revision, the FBI definition of a mass killing was four or more deaths within the same event, with no time period between the events, and typically in the same location (Morton & Hilts, 2005). This differentiated from a serial killing in which there are two or more victims by the same offender(s), in separate events occurring at different times (Morton & Hilts, 2005).

When tracking these events, one key disagreement is the number of victims that make an event a “mass” event. In contrast to FBI definitions, The Mass Shooting Tracker database reports the number of individuals shot; if there are four or more shot in one event including the perpetrators(s), regardless of whether they survive, the event is reported as a mass shooting (Mass Shooting Tracker, https://www.massshootingtracker.org/data). The Gun Violence Archive, an independent data collection and research group, uses the previous FBI definition of “four or more individuals shot and/or killed in a single incident” but does not count the perpetrator in the number of victims, to create “a clear separation between victims of a shooting and those that perpetrate the crime (Gun Violence Archive, 2016). Some data sources make the distinction between a mass shooting and a “hate crime” depending on the motive of the attacker (Gun Violence Archive, 2016), while the FBI and a number of other data sources do not consider motive in classifying mass shootings.

Typically following a crisis event such as a mass shooting, there is understandable public outrage and calls for increased services for crisis prevention and response (Greenberg, 2007a). Recent calls for gun control regulations are examples of attempts at preventing future shooter incidents (Luca, Malhotra, and Poliquin, 2016) and greater training of law enforcement to handle crisis situations exemplifies public calls for improved crisis response (Police Executive
Research Forum (PERF) and United States of America, 2014). There have also been campaigns to increase public awareness such as “See something, say something” initiatives (Reeves, 2012). However, only recently have there been public discussions of factors that might increase the chances of survival for individuals facing a crisis situation involving a mass shooting; the first recommendations for civilians followed the incidents at Virginia Tech in 2007 (Fox, 2008; Hoover, 2008). Factors such as individual attitudes and beliefs such as whether an event is survivable, the utilization of flight, fight, or freeze response, and the will to survive have been suggested in the literature as important in surviving a crisis situation. These types of factors have been included in the concept of “survival mindset” or “survival attitude” as a set of factors that may distinguish those individuals who will survive a crisis event from those people who will not survive (Leach, 1994; United States Department of the Army, 2009, Sherwood, 2009).

Researchers in the field of psychology and other behavioral sciences have focused on studying the characteristics of individuals who have perpetrated mass shootings (Langman, 2009; Lankford, 2015; Reid Meloy, Hoffmann, Guldimann, & James, 2012), have chronicled active shooter events (Blair, Martaindale, & Nichols, 2014; Muschert, 2007), and have outlined prevention strategies designed to keep public schools, colleges, universities, and other settings safe from rampage shootings (Fox, & Savage, 2009; Sulkowski, & Lazarus, 2011). Unfortunately, psychology has made surprisingly few contributions to the current state of the literature on survival mindset or individual attitudes and practices associated with a crisis event such as a mass shooting. Rather, understanding aspects of individuals’ survival during an active shooter event has been primarily the focus of law enforcement (Greenberg, 2007b). Conceptualizations and operational definitions of factors related to the psychology of survival are currently lacking, and there are few empirical studies that examine individual thoughts,
feelings, and behaviors during the crisis that might be related to survival of the event. There is also limited understanding of relationships between survival attitudes and other psychological constructs such as resiliency (Agaibi & Wilson, 2005), will to live (Stroud, 2011), and recovery from trauma (Harvey, 1996; Quiros, 2010).

The present study examines psychological characteristics that have been attributed to an increased probability of survival during an active crisis event using a sample of 401 adults living in the United States. Existing literature on the psychology of survival from a variety of disciplines has been used to develop a self-report measure of survival attitude and to examine its psychometric properties and psychological and behavioral correlates. Specifically, the Survival Attitude Scale (SAS) is a self-report measure originally designed to tap five qualities of individuals said to impact the outcome of an active crisis event (threat assessment and decision making, taking control of the situation, self-preservation, emotional control, positivity). Items on the SAS were subjected to principal components factor analysis to determine the structure of the measure and the basic psychometric properties of the measure were investigated. Participants’ scores on the SAS were compared to their responses to a survival response strategy vignette designed to assess response strategies in an active shooter on a college campus. Scores on the SAS were additionally compared with scores on self-report measures of decision making, anxiety control, self-esteem, and optimism to establish construct validity for the measure.

Conceptual Definitions and Clarification of Terms

To consider the study of survival attitude, it is important to understand the concept of “survival” and be able to identify who a “survivor” is. Survival is typically seen as a binary phenomenon: a person will either live or die (Sherwood, 2009). However, Sherwood takes a broad approach to defining survival, stating that “anyone who faces and overcomes adversity,
hardship, illness, or physical or emotional trauma” can be called a survivor (pg 16). He asserts that it is likely that everyone will, at some point in their lives, be faced with some kind of life threatening situation. His definition includes not only those individuals who have gone through an ordeal, but also the friends and family close to those individuals who serve as caretakers and provide emotional support to the survivor. Similarly, Gonzalez states that, “by definition, survivors must live” and cautions not to confuse survival with bravery or heroics (2003, p 175).

In comparison, Torrance (1953) used a more concise definition of survival, defining survival as “to live when others would die” (p 751). Torrance’s definition includes survivors of disasters and other dangerous events, as well as those individuals who have survived life-threatening medical conditions such as cancer. Some definitions that describe a survivor as “a person who has survived a difficult life event” have even been applied to those struggling with situations that are not life-threatening, such as a survivor after a loved one has died or “surviving college” (Schick, Beck, & Astor-stetson, 2011; Worick & Piven, 2004).

Definitions of survival such as these are too broad for the purposes of the present research. The experience of an individual who has survived a plane crash is likely vastly different from the experience of someone who has survived cancer and both of these likely have little in common with an individual who “survives” college. The present research takes a narrow approach to defining survival, applying the term to an individual who has survived a life-threatening situation that has occurred in the context of an emergency, disaster, or other crisis. It should be noted that some terms used to describe a sudden, life-threatening event will be used interchangeably in this paper. Stroud (2011) prefers to use the word “ordeal” to describe a critical incident; similar words that may be included here are disaster, crisis, event, incident, attack, survival situation, and emergency.
To define a life-threatening situation, Logen (1992) created a set of criteria, which include a prolonged threat to life, prolonged physical pain, suffering and debilitation, stress of fear and arousal, and prolonged and extreme uncertainty, among others. In general, the present study adopts elements of this definition, with the qualification that the present research will focus on an active shooter situation, a shorter-term event in which a survival attitude is thought to be engaged. This type of shorter-term situation requires a very quick or instantaneous response for survival, with little or no time for lengthy decision making.

In the existing literature, disasters have traditionally been divided into phases such as a pre-impact stage, an impact stage, and a post impact stage (Neal, 1997). During the pre-impact stage, actions taken are typically disaster prevention and preparedness, and post-impact behavior includes recovery from a disaster. There are a number of recommendations regarding the best course of action during these periods (Britton, 1988; Drabek, 1986; Dynes, 1970). However, for much of the history of disaster research, the period of impact has been seen as relatively uncontrollable, and very few recommendations were made in terms of general survival strategies. As Leach (1994) notes, preparation prior to the event is emphasized in the literature and a few simple strategies are suggested as helpful to victims post-impact, such as assessing their own physical and psychological condition, identifying essential tasks for survival, and breaking everyday tasks down into manageable chunks. He dismisses the need to focus on the period of impact stating that, “few people will be able to exercise much control over events during the actual period of impact, save for those precautions which have been taken during the preparation and training” (p. 126). However, scholars have increasingly recognized the possibility that following those first crucial moments in a crisis situation, individuals who are still alive may have a variety of choices, with precious little time to make split-second decisions (Siebert, 2007).
The pre-impact stage of an emergency occurs prior to the actual event, and begins at the point that an imminent danger exists (Binder & Sanderson, 1987). During the pre-impact stage of an emergency, the main focus becomes either preventing a stressor or preparedness to reduce the effects of a stressor, such as reducing casualties and decreasing damage and disruption (Aspinwall, Sechrist, & Jones, 2005; Perry, Lindell, & Tierney, 2001). Preparedness has been a major focus of the research literature since the field of disaster research began (Binder & Sanderson, 1987). On an individual level, the pre-impact stage includes activities aimed at being able to take self-protective actions and maintain access to resources (Binder & Sanderson, 1987). For example, activities such as creating a family disaster plan, storing food and water, and making sure there is access to flashlights, heat, and other necessities during a disaster are all part of preparedness activities (Perry, Lindell, & Tierney, 2001). Although research and experience stresses the importance of these activities, only 50% of individuals are likely to take recommended preparedness steps (American Red Cross, 2004). The topic of preparedness has been explored from a variety of perspectives, including the nature of threat assessment or risk perception (Sjoberg, 2000), socioeconomic factors influencing preparedness (Perry and Mushkatel, 1984; Turner, Nigg, and HellerPaz, 1986), and the social and psychological factors that contribute to differing levels of preparedness (Lindell, & Perry, 2000; Lindell, & Whitney, 2000).

The post-impact phase occurs after the event has concluded, and includes all post-event recovery and relief efforts (Binder & Sanderson, 1987). Post-disaster response and recovery is another area that has received quite a bit of research (Perry, Lindell, & Tierney, 2001). Most studies of the pre-impact and impact stages occur during the post-impact phase of a disaster (Binder & Sanderson, 1987). Post-disaster response has been studied extensively as it relates to
victims’ recovery (Quarantelli, 1999) and resilience (Bonanno, Galea, Bucciarelli, & Vlahov, 2007; Perry, Lindell, & Tierney, 2001), and in activity of first responders and volunteers after a disaster (Dynes & Tierney 1994).

The focus of the present research is on the impact phase of the crisis event, when the situation is dangerous and unpredictable (Shaw, Zelde, & Shultz, 2007). The impact stage is defined by events that result in injury to individuals or disruption of the environment (Binder & Sanderson, 1987). During the impact phase of the crisis, the individual’s life is in immediate danger with a clear threat to health and well-being. This stage of a crisis event is difficult to study, since research on events as they occur is problematic from both a practical and an ethical standpoint. However, this type of research may have the highest impact in understanding and increasing survival during an event. Aspects of the impact phase that have been studied include panic as a response (Quarantelli & Dynes, 1977), helping behavior (Frey, Savage, and Torgler, 2010; Perry, Lindell, & Tierney, 2001), and evacuation behavior (Drury, Cocking, Reicher, Burton, Schofield, Hardwick, & Langston, 2009; Kinsey, Galea, & Lawrence, 2012).

It is during the impact period that the individual is thought to be more effective if he/she is in a “survival mode” (Siebert, 2007). This is very different from the period after a disaster, where there is no immediate threat, and behaviors may be better described as “recovery” or “resilience” activities. It is important to note that the “incident phase” of an event could occur suddenly and be very brief, as in the case of an airplane crash, or could be long in coming, such as knowing when a hurricane will strike. Conversely, the incident phase could take a long time to conclude, such as the case of individuals lost in the wilderness or at sea. Given the overall lack of previous research, one aim of the present study is to describe factors that may be related to a survival attitude when there is not much time for debate or complex decision making.
New Perspectives on Emergency Response

The idea that individuals could do little or nothing to alter the course of a crisis situation changed drastically during the past decade, largely as a result of events that unfolded on September 11th, 2001. Passengers and crew members aboard United Airlines Flight 93 discovered that the terrorists who hijacked the plane were planning to crash the jet into the United States Capitol in Washington D.C. Several passengers and crew members made an assault against the hijackers and fought for control of the aircraft. The plane crashed in a field in Stonycreek Township, Pennsylvania, about 150 miles from Washington DC. Although all individuals aboard were killed in the crash, the passengers thwarted the terrorist strike by taking action.

Shortly after the events of September 11th, organizations such as the Center for Personal Protection & Safety (2016), and the AliCE Training Institute (2013), focused on the period of impact as a point of intervention in training employees and students in ways to respond in an emergency situation. Their strategy for defense involved making each individual responsible for his or her own survival by arming them with information about what actions to take during an emergency situation. Rather than waiting for first responders to take control of a dangerous situation, this new approach aims to reduce the impact of these events by utilizing those who find themselves faced with the situation.

One of the very first attempts to prepare citizens to respond in an emergency followed the school shooting at Virginia Technical Institute in April of 2007. After the shooting, crisis prevention efforts focused on improving campus mental health services, training teachers to better identify troubled students and direct them to appropriate support, and revisiting gun control laws (Leavitt, Spellings, & Gonzales, 2007). Crisis preparedness efforts included an
examination of police and administrative response, and recommendations were made for alert systems on campuses, increasing the speed of law enforcement response, and better integration of campus police and community law enforcement (Leavitt, Spellings, & Gonzales, 2007). A group of professionals from the Center for Personal Protection and Safety (CPPS) developed a training video for students that outlined techniques that would increase their chances of survival in a similar situation (CPPS, 2010). The video, entitled, “Shots Fired on Campus,” is designed to teach students to acquire a “survival mindset” and asks them to consider their options for reacting to an active shooter situation. It was produced for university and college campuses with the goal of helping empower students with knowledge to prevent an active shooter incident, as well as guidance on how to gain a survival mindset that will assist them in taking action to save their own lives during a mass shooting incident (CPPS, 2010).

The Shots Fired video is approximately 20 minutes long and begins with a discussion urging students to recognize that active shooter situations are low probability, yet possible, events (CPPS, 2010). The narrators explain that until help can arrive, students will be responsible for their own safety. Next, there is an explanation of characteristics of survivors, such as taking responsibility for oneself and making a commitment to survive, and the questions that survivors ask themselves before an incident occurs, such as “what would I do?” or “where would I go?” According to the video, survival mindset is defined as a combination of awareness, preparation, and rehearsal. Specific information about active shooter events is then presented along with recommendations regarding what steps to take and questions to consider as the situation gets increasingly dangerous. Students are instructed to get out if they can safely escape, hide out if they can barricade themselves someplace safe, and take out the shooter as a last resort if they find themselves with no other options for survival. They are also encouraged to work
together, communicate with one another to make a plan if it’s safe, and help each other if possible. At the same time, students are urged to act for themselves without waiting for group consensus (CPPS, 2010).

The “Shots Fired” video represented a shift in thinking about an individual’s’ response in a disaster or emergency situation. For the general public, disaster preparedness is generally taught largely in the form of “to do lists” for a specific disaster situation. This includes teaching people how to exit a building in case of a fire, steps to take in case one sees a tornado funnel cloud when driving, recommendations for what to do and not do during a flood, and information about evacuation if necessary. Each disaster situation has its own training and set of recommendations; websites such as ready.gov and redcross.org encourage individuals to read about disasters that are likely to occur in their area and know how to appropriately protect oneself (American Red Cross, n.d.; Be Informed, n.d.). Unfortunately, people are usually unwilling and unable to remember sets of “to-do lists” in a variety of low probability scenarios. For example, results of a poll of over 2,500 people conducted by the Red Cross and Harris Interactive (New Poll, 2007) found that 93% of respondents reported that they did not take the three recommended disaster preparedness steps from the Be Red Cross Ready campaign. The recommended steps are to make a disaster kit, make a plan, and be informed.

History of Research on Survival

Samuel Henry Prince is sometimes considered the first person to have done research on disasters (Ripley, 2009). His 1920 dissertation at Columbia University, “Catastrophe and Social Change” was a sociological study of the Halifax Disaster (Prince, 1920). He writes that his intention is to describe the “shock and disintegration” as he observed it, as well as the “individual and group reactions” (Prince, 1920, p 7.) He discussed several reactions such as
shock, hallucinations, “primitive instincts” and a range of emotional responses. Other early literature on issues related to the psychology of survival or survival attitude focused on defining reactions to stress and was predominantly an exploration of the negative symptoms that result from exposure to extreme conditions (Lifton, 1954; Segal, 1954; Strassman, Thaler, & Schein, 1956; Wolf & Ripley, 1947). A first person account by Nardini (1952), a medic who was imprisoned by the Japanese from 1942 until 1945, is especially noteworthy because he attempts to describe factors related to survival in the prison camp.

In the 1940’s and 1950’s, much of the survival research was done by military or other government organizations, and focused on survival in specific situations, such as Air Force personnel forced down in enemy territory (Torrence, 1954). This research relied primarily on analysis of first-hand accounts from those who had survived a critical event. These military studies focused on making recommendations for training future soldiers. For example, for group survival situations, trainings were designed to facilitate better communication, create clearly structured roles, and facilitate the formation of common goals (Torrence, 1954). For individual survival settings, soldiers were cautioned that they were more likely to become panicked or make bad decisions when they were separated from the group and their morale was low (Torrence, 1954).

Recent research on the topic of survival continues along similar methodological lines: following an event, survivors and witnesses are often solicited for first-hand accounts by journalists, outdoor survivalists, and researchers (Gonzales, 2009; Leach, 1994; Ripley, 2009, Sherwood, 2009, Stroud 2011). Oftentimes, the accounts are archival (Drury & Cocking, 2007) and some interviews are collected years after the event, which can lead to memory distortions, particularly of these highly emotional events (Dezecache, 2015). In some cases, these accounts
are synthesized, themes are gathered, and recommendations are made about surviving a
particular event, or survival in general, or most infrequently, psychological aspects of survival.
On occasion, other methodologies are used, such a study by Drury, Cocking, and Reicher (2009)
using virtual reality to examine individual's behavior in a crowded subway fire. Another example
is a study of fear and temporal perception which required participants to fall backwards off a
tower for 31 meter and a 2.49 second freefall (Stetson, Fiesta & Eagleman, 2007).

Although there is a lack of systematic research on disaster survival, there are many
popular books available that provide tips on surviving a crisis event, such as being lost in the
woods or experiencing a natural disaster (such as Angier, 2001; Hamilton, 2005). Most of these
books focus on practical survival tips, such as water procurement, building a shelter, starting a
fire, etc. Some books also provide a section or a chapter discussing the psychological aspects of
survival. Such chapters often include discussions about broad behaviors that can be applied to a
variety of situations (Lundin, 2003; 2007). For example, the US Army Survival Manual (2009)
devotes the first chapter to the psychology of survival, instructing ways to remain focused on
survival and generally maintain the “will to survive.” The majority of recent books on the topic
include at least some mention of the importance of the psychological aspects of survival (Pred,
2015; Steward, 2013). However, these books are very general in describing which psychological
aspects are important, and they invariably fail to reference studies to support even those limited
claims.

**Elements of a Survival Attitude**

Unfortunately, there is little agreement among scholars on a set of psychological
elements that are considered to be essential for survival of a crisis event. Siebert (2006)
describes a survival interaction style or personality that he believes assists people in surviving
disaster events. This interaction style includes qualities such as being able to absorb information quickly, determining that the situation can be influenced in a positive manner, and finding any action that can impact the situation in a positive way. He discusses the ability to exist in the extremes, for example, being at the same time selfless and selfish. In terms of particular traits, he points to curiosity, flexibility, and empathy, among others, as important. Similarly, Sherwood (2009) explores instances of survival to determine the important lessons and attributes that allow a person to survive. He uses this information to classify what he believes are five different types of survivor personalities and lists twelve “survivor tools” that survivors tend to use. These tools include adaptability, resilience, faith, hope, purpose, tenacity, love, empathy, intelligence, ingenuity, flow, and instinct. Watson (2005) suggests that “thinking like a survivor” is a skill that will help prepare an individual for a crisis situation. Watson recommends that people “develop themselves mentally” while also working to increase their understanding, preparation, training, and practice of outdoor survival skills (2005, p. 5).

In contrast, Leach (1994) focused his research on individuals who did not survive a crisis when there is evidence that they could or should have survived. He asserts that fatalities occur during crisis events because some events simply are not survivable regardless of doing everything “right.” One example would be the first people targeted by a shooter in a busy mall, since the actions of these people would not have had any impact on their being shot or killed. Leach (2004) focuses his research on both survivors and victims who might have survived with particular focus on those individuals who perished despite having had a chance of surviving.

Over the course of his career, Leach studied survivors of many types of emergencies, including shipwrecks, aircraft accidents, parachute accidents, and others (Leach 1995; Leach, 2004; Leach, 2005; Leach, 2011; Leach & Ansell, 2008; Leach & Griffith, 2008). He uses
eyewitness testimonies, survivor debriefings, official inquiry reports, observation in high stress situations, and simulations to analyze behavioral responses to emergencies (Leach, 1995; Leach, 2002; Leach, 2004; Leach, 2005, Leach, 2011; Robinson, Leach, Owen-Lynch, & Sünram-Lea, 2013). He has studied memory, attention, executive functioning, visual search and navigation, effects of stress, level of expertise, and personality in field survival exercises, in the lab under conditions of stress, and before and after military deployment and capture (Leach, 2002; Leach 2004; Leach 2005; Leach 2011; Leach, Almond, 1999; Leach & Ansell, 2008; Leach & Griffith, 2008; Leach, McLean, Almond, & Mee, 1992; Leach & Morris, 1998; Marsden & Leach 2000; Porter & Leach, 2010; Robinson, Leach, Sünram-Lea, & Owen-Lynch, 2004; Robinson, Leach, Owen-Lynch, & Sünram-Lea, 2013, Wagstaff & Leach, 2015). As a result of his research, Leach has proposed the theory of 10-80-10, which states that about 10% of individuals will handle a crisis in a calm and rational state of mind, 80% will be confused and overwhelmed, and 10% will do things that decrease their chances of survival. The first 10% are the survivors; they pull themselves together quickly, assess situations clearly, and make sharp, focused decisions. According to Leach (1994), survivors are those people who develop priorities, make plans, and take appropriate actions.

According to Leach, the vast majority of individuals caught in a crisis event do not know how to respond to disasters appropriately. For this group, Leach reports that reasoning is “significantly impaired and that thinking is difficult…. [individuals behave in] a reflexive, almost automatic, mechanical manner” (as cited in Sherwood, 2009, p. 48). Most individuals will respond to crises by feeling lethargic, sweating, feeling sick, having racing hearts, and experiencing tunnel vision or perceptual narrowing, an overall reduced awareness of the situation. The ability to recover quickly from this “brain lock,” regroup from the shock, and
begin making decisions about what to do is key for survival, according to Leach (Sherwood, 2009). Leach’s theory also posits that 10% of individuals do the wrong thing in a survival situation. These individuals engage in behaviors that are inappropriate or counterproductive or for a variety of reasons are thought to be unable to engage in effective problem solving.

The United States military is invested in understanding survival to teach soldiers how to think in a survival situation. The US Navy sees survival as, “a mentality, a way of thinking,” as well as a lens or a way of perceiving the world (Sherwood, 2009; p. 8). The U.S. Army Survival Manual contains a section in the introductory chapter about the “will to survive,” with the first sentence stating that, “survival is largely a matter of mental outlook, with the will to survive the deciding factor” (Department of the Army, 2009, p. 2). The authors encourage keeping a focus on survival with the acronym S.U.R.V.I.V.A.L., which stands for: S - size up the situation, U - undue haste makes waste, R - remember where you are, V - vanquish fear and panic, I - improvise, V - value living, A - act like the natives, and L - learn basic skills. Each of these objectives is then detailed in the manual before the discussion moves on to more practical issues such as avoiding detection and capture.

Similarly, the US Air Force has its own take on the key points to consider in a survival situation. They teach that there are six “threes” to survival, two of which are related to the individual's attitude and psychological well-being. The Rule of Three states that you cannot survive three seconds without spirit and hope, three minutes without air, three hours without shelter in extreme conditions, three days without water, three weeks without food, or three months without companionship or love (Sherwood, 2009). The psychological side of survival is reflected in both the first and the last of the rules, with spirit and hope being seen as essential to surviving even three seconds in a survival situation.
From a review of existing literature, five major elements related to a survival attitude include 1) Threat assessment and decision making, 2) Control of the physical setting or situation, 3) Desire for self-preservation, 4) Personal emotional control, and 5) Sense of hope or positivity. It should be noted that the present study does not approach survival attitude as an aspect of one’s personality or as a single personality trait, but rather views survival attitude as a collection of “psychological skills” that can be useful in response to a number of life threatening events. This conceptualization is similar to the concept of “resilience” as an “interaction between an individual, his or her past experiences, and current life context” which is malleable and can be improved with training (Meredith et al, 2011; p. 3). Each of the five major elements of survival attitude is examined in further detail.

**Threat Assessment and Decision Making**

One important survival skill discussed in previous literature is the ability to accurately determine whether there is a legitimate safety threat and to make sound decisions based on that assessment (Watson, 2005; Kinsey, Gaela, & Lawrence, 2010). In an emergency, those with a survival attitude are able to quickly and accurately assess the situation and determine their own level of danger (Sherwood, 2009; Siebert, 2007; Watson, 2005). They observe the environment to develop a realistic view of the situation in the moment, anticipate potential threats, and make logical decisions based on their previous knowledge and experience (Sherwood, 2009; Siebert, 2007; Watson, 2005). They use common sense to understand the situation and consider a number of creative alternative responses before making a choice about how to proceed (Kinsey, Gaela, & Lawrence, 2010; Sherwood, 2009; Siebert, 2007).

Kinsey, Gaela, and Lawrence (2010) contend that situational awareness is a main factor in survival across situations. The disaster management literature, designed to assist officials and
decision-makers in understanding what to do during an emergency, defines situational awareness as a three-part process (Mohsin, Steinhäusler, Madl, & Kiefel, 2016). The process includes the perception of the critical and relevant factors in the environment, the ability to determine the meaning and importance of these factors, and the ability to project the impact of those factors into the future to determine how to respond (Mohsin, Steinhäusler, Madl, & Kiefel, 2016). Part of the US Marine Corps aviation survival training concerns teaching the importance of situational awareness, defined as “knowing what’s going on around you at any given moment and being able to anticipate danger” (Sherwood, 2009; p. 12). This is also similar to the concept of mindfulness, a behavioral constructed described by Bernstein, Tanay, and Vujanovic (2011) as a combination of mindful attention and awareness. Their research found that increased mindfulness after a traumatic event was related to decreased symptoms of PTSD, anxiety, and depression, among other symptoms, which they described as evidence of trans-diagnostic resilience.

Watson (2005) also discusses the importance of situational awareness. He references the Alaska Marine Safety Institute’s “seven steps to survival,” used in training programs for the US Coast Guard (Watson, 2005). The first of the seven steps is awareness: acknowledging that one is in a very serious and potentially life-threatening situation, accepting it, remaining composed, and “kicking it into gear.” Likewise, the seventh step is to be psychologically minded, which includes play as a method of stress relief to develop attention in the present moment. Watson (2005) includes a number of mental elements important for survival in this idea of awareness, such as the importance of prioritizing and knowing the important factors that one should take into consideration in a survival situation.
Along these lines, in the US Army survival school, soldiers are subjected to high levels of physical, environmental, and psychological stress and are rated by trainers on their behavioral performance (Morgan et al, 2000). Specifically, attendees are scored on observed, classified target behaviors that have been determined by the Army and the Joint Services Survival, Evasion, Resistance, and Escape Agency (JSSA) to contribute positively to survival in an enemy interrogation situation. One such target behavior is mental alertness. Demonstration of a target behavior like mental alertness is expected to indicate an ability to effectively engage in the situation and maintain “cognitive operations” during the exercise (Morgan et al, 2000).

Sherwood (2009) states that survivors understand that crisis is inevitable and anticipate adversity; when faced with a challenge they observe and analyze the situation, devise a plan, and move decisively. Siebert (2007) reported that, in an emergency, some people “quickly comprehend the reality of the new situation, accept that they could die but don’t panic, and take action to increase their chances of surviving (p.1).” He asserts that individuals who are likely to survive naturally behave in ways that increase their chances of survival. They are thought to quickly absorb accurate information about the crisis situation, feel confident that they can influence the situation in a positive way, be willing to consider a variety of possible responses, and do whatever it takes to survive. Sherwood (2009) contends that survivors can subconsciously perform a simultaneous review of their options for response, allowing them to choose an appropriate reaction quickly.

Siebert (2007) lists a number of questions that survivors are thought to reflexively ask themselves during a crisis event, such as what is happening or not happening, how they should immediately react, how much time they have to react, whether a response is required, what the responses of others are, and why other individuals in the crisis are reacting as they are.
According to Siebert (2007), survivors also consider their role in the scene, identify individuals who are aware of the survivors’ presence and the implications of that level of awareness, are able to “read” the dangerous person’s emotional state, can assess the overall degree of danger, and are aware of the feelings and behaviors of others at the scene. This thought process helps the survivor to develop a big-picture understanding of the immediate event and allows for better decision-making, thereby increasing the individual’s chances of survival. For Siebert, attention to these topics can allow individuals to maintain an open mind about the situation, to avoid imposing “pre-existing patterns on the new information,” and allow these individuals to create a new “mental map” of what was occurring as needed (2007; p. 2). Siebert highlights the qualities of flexibility, adaptability, and divergent thinking as hallmarks of survivors.

**Control of the Physical Setting or Situation**

In an emergency situation, survivors take an active response (Leach, 1994; Sherwood, 2009). They analyze the situation, consider a number of options, quickly choose an appropriate action, and carry it out decisively. Rather than act impulsively, they consider the most effective moment for action and can hold back when necessary (Sherwood, 2009; Torrance, 1953).

“Active Passiveness” is one unexpected behavior that has been named useful by survivors, defined as considering a most advantageous time to act or wait (Sherwood, 2009). Survivors know how to wait for the worst to end and have the ability to recognize when to go and when to stop; they are able to hold back, identify the right moment, and then do what they need to do (Leach, 1994; Sherwood, 2009). Sherwood (2009) acknowledges that doing nothing can be a form of doing something, that inaction can be action, and that embracing this paradox can save one’s life.
Contrary to common perceptions, research suggests that there are a number of important things that individuals can do to increase their chances of survival even in situations where the individual would appear to have little control. In the context of surviving an airplane accident, Stroud (2011) discussed the importance of a plan to increase chances of survival and offered suggestions for prioritizing the most essential elements, such as focusing on emergencies, signaling for rescue, and planning for survival. Similarly, Sherwood (2009) suggests formulating an “action plan” in case escape is necessary. This includes memorizing the emergency exits and counting the rows to the nearest one, locating backup exits, and deplaning as quickly as possible. Additionally, Sherwood recommends that people prepare themselves to be competitive in an emergency, as it may be necessary to push past people who are frozen or to vie with others for access to escape routes. In Torrance’s (1953) study of unhelpful behaviors in a war survival situation, he suggested that there were two types of behaviors that were detrimental to survival. The first type of detrimental behavior he described as “random trial-and-error type of behavior,” where an individual could not formulate a consistent plan of action. A second detrimental behavior was overall passivity in “the development of a feeling of hopelessness which usually led to surrender to the enemy” (p. 752).

**Self-Preservation**

Self-preservation is thought to be another relevant component of a survival attitude. In an emergency, people with a strong sense of self-preservation and “will to live” are determined to survive (Nardini 1952, Sherwood, 2009; Stroud, 2011). They quickly accept the seriousness of the situation and persist in finding ways to protect themselves; they are fighters (Greer, Morris, & Pettingale 1979; Sherwood, 2009; Watson, 2005; Watson, Haviland, Greer, Davidson, & Bliss, 1999). They value their life and their continued survival, and prioritize their responses
based on that survival goal, even if doing so means behaving in ways that might be seen as cold or ruthless (Frankl, 1984; Sherwood, 2009).

The will to survive is sometimes described as a primary quality of individuals that explains the reason why some individuals survive in the face of extreme situations while others perish. Generally, the will to live is defined simply as making a choice to survive (Sherwood, 2009), or an absolute refusal of an individual to give in to death (Stroud, 2011). Stroud (2011) suggests a number of ways that individuals can bolster the will to live, such as thinking of loved ones, relying on spirituality, or determining a goal. Survival manuals typically name the will to live as a critical tool for survival. For example, the US Army *Field Manual for Survival* (FM 21-76) states that “survival is largely a matter of mental outlook, with the will to survive the deciding factor” (US Army, 2011).

Early writers such as Bruno Bettelheim (1943) described the will to live “was absolutely critical” for survival in the Nazi concentration camps. Similarly, Nardini (1952) believed that having a strong ego, a sense of self-esteem, a feeling of self-identification, and an ability to connect with the past to look forward to the future (while to some extent ignoring present circumstances), was critical in maintaining a will to live. More recently, Watson (2005) described the importance of a positive mental attitude and asserts that his purpose is not to teach survival techniques but rather to give people the tools they need to think like a survivor. He expresses his belief that the three main necessities in a survival situation are common sense, a handful of basic skills, and most importantly, the will to live.

Similar to the concept of the will to survive is the idea of an individual’s “fighting spirit.” Research on the fighting spirit has largely focused on the survival rates of cancer patients. For example, Greer, Morris, and Pettingale (1979) studied 69 women with breast cancer
and found that only 40% of women classified as having either a “helpless and hopeless” attitude or a “stoic acceptance” of their illness were alive five years later. However, 75% of women who were said to have a “fighting spirit” or were in “denial” about their cancer had a five year survival rate. Subsequent studies produced mixed results regarding the “fighting spirit,” although studies supported results suggesting that people with a “helpless and hopeless” attitude had the worst outcomes (Coyne & Tennen, 2010).

Holocaust survivors of World War II are a special group of survivors who have endured unspeakable atrocities. To understand how individuals were able to survive the holocaust, Helmreich (1992) compared a group of 211 Jewish holocaust survivors from World War II with a group of 295 US born Jews of a comparable age who had not been traumatized by the holocaust. Overall, he found that holocaust survivors were more “successful” in terms of being married, having lower divorce rates, and seeking less mental health assistance than adults who had not experienced the holocaust. Helmreich attributed this success to what he termed “resilient traits” of holocaust survivors- traits such as adaptability, initiative, and tenacity. Other qualities thought to aid these survivors include toughness, ruthlessness, and selfishness (Helmreich, 1992). Leventhal and Ontell (1989) credited holocaust survivors’ success to characteristics such as being task-oriented, utilizing active coping mechanisms, and expressing favorable attitudes toward family, friends, and work. Some scholars argue that in concentration camps, traits such as compassion, altruism, and selflessness guided individuals to form alliances (Sherwood, 2009). These alliances, in turn, led to people helping one another by sharing rations, tending to the sick, and communicating vital information—all behaviors that ultimately facilitated their mutual survival (Sherwood, 2009).
An alternative view is that individuals who were less kind and generous had an advantage in surviving the Nazi death camps. Primo Levi, who spent eleven months in Auschwitz stated that, “the worst of us survived....the selfish, the violent, the insensitive, the collaborators....the spies...that is, the fittest.” (Levi, 1996). Viktor Frankl agreed, stating that, “only those prisoners could keep alive [sic] who...had lost all scruples in their fight for existence; they were prepared to use every means, honest and otherwise, even brutal force, theft, and betrayal of their friends, in order to save themselves” (Frankl, 1984, p19). Day-to-day survival under such circumstances also depended on a purposeful psychological turning, a “psychic act” that required them to choose action over passivity, and to overlook the horror so that they could focus on the work of staying alive (Sherwood, 2009).

To investigate the role of altruism and selfishness in the face of disaster, Frey, Savage, and Torgler (2010) studied historical accounts of passengers on the Titanic, the British passenger liner that sank on its maiden voyage in 1912. These researchers found that altruism played a role in the survival of women and children above men on the Titanic. Higher social class and being a crew member also accounted for higher survival rates on the Titanic. However, a study comparing behavioral differences in survival on the Titanic to those on the Lusitania found selfish behavior more highly associated with survival on the Lusitania (Frey, Savage, & Torgler, 2010). Authors attribute the shorter length of time to save oneself (two hours and 40 minutes for the Titanic to sink vs. 18 minutes for the Lusitania) was a factor in a stronger competition for survival on the Lusitania. Similar studies of survival of disasters caused by fires also suggest mixed results for the role of selfishness and altruism in survival rates (see: Aguirre, Torres, Gill, & Lawrence Hotchkiss, 2011, Feinberg, & Johnson, 2001; and Johnson, 1988). It is still
relatively unclear what factors might relate to altruism or selfishness as a strategy for surviving a disaster.

Perseverance is thought to be an essential element contributing to survival during a crisis event. In a study of 30 survivors of the Khmer Rogue period in Cambodia, individuals were asked about elements instrumental to their survival (Overland, 2011). One of the four factors that survivors pointed to as most helpful during the time of their capture was perseverance, along with the ability to adapt, caring for others, and religious beliefs or practices. Sherwood (2009) determined that two kinds of “personalities” emerged from his review of data regarding skydiving emergencies. Sherwood (2009) found individuals who would not give up and continued problem solving in an effort to save their lives, and individuals who gave up quickly and resigned themselves to death. According to Sherwood (2009), three main survival lessons that emerge from this data are the importance of staying calm, the need to stay focused on one’s surroundings in an emergency, and the need to be persistent and not to give up trying to find a solution to resolve the crisis.

**Personal Emotional Control**

Personal emotional control as a survival strategy is consistently emphasized in existing literature (Sherwood, 2009; Siebert, 2007; Stroud, 2011). In an emergency, survivors can stay calm and composed despite the circumstances. They use emotional control to improve their awareness, and remain rational and focused in an effort to choose the most effective course of action in an emergency (Sherwood, 2009; Stroud, 2011).

Sherwood refers to fear as the most “ancient, efficient, and effective security system in the world,” (2009, p. 227). At the same time, fear and panic can prevent people from acting rationally (Sweeney, 2009). Individuals are most successful when they can manage their fear;
when it becomes uncontrollable, survival odds decrease (Sherwood, 2009). Fear can activate the "fight or flight" response, a typical physiological response to danger that can lead to panic. This panic can cause individuals to respond quickly to flee or to thrash about (Sherwood, 2009). It can also cause someone to panic and freeze or not be able to make decisions.

Seibert (2007) similarly believed that survival chances greatly improved when individuals were able to stay calm. He considered staying calm absolutely critical for survival and believed that it can be considered the opposite of panic. Panic has been defined as involving an emotional and behavioral component. This includes an excessive feeling of fear or high emotional arousal along with irrational, non-adaptive flight or other inappropriate course of action to save oneself (Chertkoff & Kushigian, 1999; Dezecache 2015). Interestingly, survivors may describe a sense of panic during a disaster situation even when their behaviors are rational; Dezecache (2015) suggests that panic comes from a lack of information about the event. While panic reduces effectiveness and clouds thought processes, being calm improves awareness and effective actions (Siebert, 2007). Stroud (2011) describes a number of negative emotions - panic, fear and anxiety, anger and frustration, loneliness, boredom, and depression - that can all contribute to threats to survival.

Panic happens when the fight or flight instinct causes the adrenal glands to pump out hormones which increases pulse, breathing rates, injects glucose into the body to increase metabolism, causes visual narrowing and changes in temporal perception, and reduces fine muscle control (Sherwood, 2009). Debiec and LeDoux (2004) describe two neural pathways in the brain; one neural pathway is an immediate response to a danger cue and occurs in the amygdala after traveling the thalamic pathway. The immediate response typically produces a very quick "freeze" response. The second neural pathway is a slightly slower process, along the
cortical pathway to the cortex, where the brain takes a little longer to process the danger cue. There, it gets identified and a decision can be made as to the best response. (The defense cascade is the term for the range of defensive responses which include arousal, freezing, fight or flight, tonic immobility, collapsed immobility, and quiescent immobility. See Kozlowska, Walker, McLean, and Carrive 2015 for a detailed description of the neural pathways involved.) Debiec and LeDoux state that survival depends on an individual's ability to control this first reaction and act on deliberate action. In other words, instead of just reacting, individuals need to learn to control their fear response and think rationally.

**Hope and Positivity**

In an emergency, the people who are positive, optimistic, hopeful and open to experiences are more likely to survive (Chang, 2001; Jackson, 1992; Sherwood, 2009; Siebert, 2006; Watson, 2005; Wilkes, O’Baugh, Luke & George, 2003, Wiseman, 2003). Positive people actively avoid unhelpful thought patterns that don’t work to solve problems. They improve efficiency by decreasing stress with humor (Henman, 2001; Nardini, 1952; Watson, 2005) or by relying on their faith (Pargament, Koenig, Tarakeshwar, and Hahn, 2001; Ripley, 2009; Sherwood, 2009). They have confidence in their ability to handle difficult challenges (Siebert, 2007).

A "Positive Mental Attitude" (PMA) is defined as "a positive approach to the situation by being prepared, being mentally aware, and constantly maintaining an attitude of survival," (Watson, 2005, p. 5). Watson (2005) asserts that PMA is more important than survival gear, the most advanced training, and luck. The research literature is vague concerning the qualities of a PMA, but it is often equated with positive thinking (Jackson, 1992; Wilkes, O’Baugh, Luke & George, 2003) and hope and optimism (Chang, 2001).
According to Watson (2005) “without being consciously aware of it, most survivors had many of the qualities of a positive mental attitude: they never gave up, had the will to live, and an attitude that they would survive despite the dire situation.” Watson believes that it is possible and vital to develop a PMA by learning to prioritize, improvise, seeing the multiple utility in everyday items, and anticipating problems and solutions. Stroud (2011) believes that the will to live stems from a positive attitude - the force that keeps someone moving forward.

Similar to the issues seen with the concept of the fighting spirit, there has been criticism that PMA can be potentially harmful. For example, it is detrimental to have cancer patients believe that they must always stay positive as opposed to experiencing a range of emotions (Rittenberg, 1995). Siebert (2006) also notes that a positive attitude is more than having positive thoughts - it is a combination of reflexive mental, emotional, and behavioral habits that cannot be changed by suggesting that people change what they think. He suggested that self-confidence, the ability to learn from even negative experiences, and always striving to improve helps survivors to handle new, unfamiliar, and difficult challenges (Siebert, 2007). Survivors understand that challenges are a part of life, and accept them as they come (Sherwood, 2009).

There has been considerable debate about role of optimism and hope in surviving a crisis. Siebert (2006) defines optimism as the belief that good things will happen while hope is a desire that negative circumstances will improve in the future. Siebert (2006) claims that optimism is a global world view while hope is situation-specific. Siebert (2006) stated that hope helps people “endure longer, which can lead to healing, rescue, or the end of bad circumstances” (p. 107). Hope is meaningful to survival when people are struggling as it allows them to imagine a better future. According to Siebert (2005), a person without hope is lost with no direction, courage, or resilience. He contends that optimism leads to a belief that everything will work out
for the best and that hope provides more of a realistic view of the problems, obstacles, and difficulties and “finds a possible realistic path to a better future,” (p. 109).

Luck is generally thought of as a random, uncontrollable factor in survival. When Helmreich (1992) interviewed a sample of 211 holocaust survivors, he found that 74% of them pointed to luck as the main factor in their survival, while 27% believed that it was their coping skills that aided survival. Traditionally, luck is seen as "an unpredictable phenomenon that leads to good or bad outcomes" (Sherwood, 2009, p. 189). In contrast, Wiseman (2003), a prominent researcher on the topic of luck, believes that luck is related to an individual's' ability to be open to random opportunities, even when focused on other tasks. Weisman relates luck to the personality trait of neuroticism. He contends that people who have higher neuroticism are more anxious, tense, and sensitive to stress miss positive or “lucky” opportunities around them. In addition, people who believe themselves to be lucky are measurably more “lucky” than those who do not (Siebert, 2006.)

Wiseman (2003) believes that there are four reasons that lucky people are lucky. First, lucky individuals are open to unexpected possibilities; they are more relaxed and social. Second, they rely on their intuition and use it to make good decisions. Third, lucky people persist in the face of struggles and have an optimistic view of the world. Finally, they have an ability to turn misfortune into advantage. According to Weisman, people who tend to be lucky see situations in terms of "how much worse things could have been" and feel lucky that they were not. Unlucky people tend to believe in any negative situation as a bad thing, and consider themselves to be unlucky (Wiseman, 2003).

Faith is another psychological process that is often emphasized as important in survival. There is evidence that individuals who attend church live longer than those who do not, with
those who attend weekly living approximately 6.6 years longer than those who do not and those attending more than once a week living approximately 7.7 years longer (Sherwood, 2009). Interestingly, in a study of hospitalized patients, Pargament and colleagues (2001) found that individuals who reported that they were struggling with their religious beliefs had an increased likelihood of dying. Patients who reported religious struggles had a 6 to 10% greater chance of dying than those who weren't in religious turmoil. In first person accounts, survivors point to their faith as an integral part of their survival. Survivors discuss faith as a source of strength helping them to push forward, giving them hope and a sense of meaning and purpose that is beneficial in overcoming incredible adversity (Sherwood, 2009).

Siebert (2007) noted that having a sense of humor enhances survival by decreasing emotional arousal and reducing tension to moderate levels, thereby improving efficiency. According to Siebert (2007), the element of humor brings with it a perspective that the situation can be conquered and that the playful emotionality in humor can lead to the discovery of creative solutions. Similarly, in her book reviewing behavior in disaster, Ripley (2009) posits that laughter can reduce emotional arousal and increase feelings of perceived control. In describing his prison camp experiences, Nardini (1952) felt that having a sense of humor was important in survival and debated whether the capacity to see humor in dire situations was intrinsically helpful or if humor was indicative of other strengths that were important to survival. In her qualitative study of 50 Vietnam prisoners of war, Henman (2001) concluded that humor served to assist captives in identifying on their own sense of power and gaining a perceived sense of mastery over their circumstances. According to Watson (2005) the use of humor in a crisis event can help ease anxiety, instill confidence, and facilitate cohesion and reassurance in a group of people facing uncertain circumstances.
Survival Attitude and Exposure to Traumatic Events

There are reasons to suggest that previous exposure to traumatic events might have a relationship to survival attitude. Research has identified increases in depression and anxiety and overall stress among survivors of various types of disasters (Ollendick & Hoffmann, 1982). Other impacts include somatic complaints, increases in alcohol use, anger, irritability, and violence among survivors as compared to non-distressed samples (Tolin & Foa, 2006). The research on exposure to disasters has also shown some other interesting results. For example, in a study of behavioral changes after having experienced an earthquake, preparedness activities such as storing necessary survival items for future use and having a plan in place increased in a sample of 1,346 of Californian participants (Russell, Goltz, & Bourque, 1995). Similarly, in a study of 302 residents of 3 seismic risk zones on the west coast of North America, those with major losses in a previous earthquake show an increase in preparedness activities as compared to respondents who had experienced little or no losses (Jackson, 1981). Of those individuals in the study who had experienced major losses in a past earthquake, 52% had since taken earthquake precautions. Of those who had experienced minor losses in a past earthquake, 30.1% had since taken earthquake precautions. Finally, of those individuals who had not experienced losses, 20.1% subsequently took earthquake precautions.

Another interesting disaster exposure issue is that of “inoculation effect” for disasters. There appears to be conflicting evidence of this phenomenon. Some studies have found that those individuals exposed to previous disasters show less distress in subsequent disasters. For example, Norris and Murrell (1988) studied 234 older adults exposed to multiple floods and found no increased symptomatology in individuals exposed to a recent flood when controlling for pre-flood symptoms. However, a study of 772 factory workers in Naples, Italy by Bland,
O'leary, Farinaro, Jossa, and Trevisan (1996) found that while those individuals with previous earthquake experience reported less distress than novice earthquake victims, there was evidence of increased anxiety in those who had been evacuated and also had prior earthquake damage.

Importantly, in the earthquake study by Jackson (1981), those individuals with any previous disaster experience preferred to implement “event response adjustments” over precautionary behaviors put in place prior to an earthquake (Jackson, 1981). That is, individuals would rather adopt behaviors that could be implemented at the time of the earthquake, such as going outside or going to a safe place, than activities beforehand, such as securing belongings or doing earthquake drills. We can only speculate the reasons for this preference. One reason could be related to increased confidence after having survived a previous earthquake. Perhaps previous survival increases survival attitude, making those who have survived a life threatening experience feel more confident about surviving the next emergency event. Survival attitude may influence the increases in some preparedness behavior and help explain the inoculation effect.

One goal of the present research is to explore the relationship between survival attitude and previous disaster experience, with the expectation that those who have survived previous events will show a higher level of survival attitude. Future research may delve further into the specifics of this relationship, including what types of experience (i.e., being a direct victim of a disaster vs living in a community where a disaster has occurred) is most helpful in activating a survival mindset or whether experiencing one type of disaster influences mindset for other types of emergencies (Perry, Lindell, & Tierney, 2001).

**Survival Attitude and PTSD**

Post-Traumatic Stress Disorder (PTSD) is an anxiety disorder associated with a traumatic experience. This is defined by a situation in which a person is exposed to the death or deaths of
others, threatened death to oneself or others, experiences a serious injury or threat of serious injury to oneself or others, or experiences sexual violence or a threat of sexual violence by either experiencing the event themselves, witnessing the trauma, learning that a relative or friend was exposed to trauma, or by indirect exposure to aversive details of the trauma (American Psychiatric Association, 2013). To be diagnosed with PTSD, an individual must experience four main symptoms: avoidance of related stimuli, re-experiencing the event, negative thoughts or feelings beginning after experiencing the event, and arousal or reactivity related to the trauma (American Psychiatric Association, 2013). These symptoms must also last for more than one month, create distress or impairment, and be unrelated to medication, substance use, or a medical condition (American Psychiatric Association, 2013).

PTSD rates vary but tend to be estimated relatively low in most studies. The national lifetime prevalence of PTSD is estimated at about 7.8%, and 3.5% for the yearly prevalence, as reported by the National Comorbidity Study (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). PTSD rates often depend on the situations that individuals were exposed to, as well as the measures used to assess PTSD (Breslau, 2001). More recently, a study analyzing prevalence rates based on the DSM-V criteria found a lifetime prevalence rate of 9.4% and a 12 month prevalence of 5.3% in an online survey of 2,953 individuals (Kilpatrick, Resnick, Milanak, Miller, Keyes, & Friedman, 2013).

Theories of PTSD vary, making it difficult to predict how PTSD might relate to survival attitude. One PTSD theory suggests that it is an overlearned survival response that is related to a limbic system rehearsal of traumatic memories (Silove, 1998). According to this theory, while later brain mechanisms developed to help cognitively process these memories, it is proposed that there was a desynchrony between these two systems in some individuals that made
them vulnerable to the symptoms associated with PTSD (Silove, 1998). A similar theory posits that increased sympathetic nervous system (SNS) activity accounts for PTSD symptoms. A review by Morris and Rao (2013) reported inconsistent results for studies that associated PTSD symptoms with SNS symptoms at different timepoints after the trauma. However, there was consistent evidence of increased SNS reactivity to trauma scripts and acoustic startle response that were related to PTSD (Morris & Rao, 2013). Further, there was consistent evidence of increases in epinephrine and norepinephrine in PTSD individuals, particularly when levels were tested in response to a challenge, such as a psychosocial stress task. If PTSD is part of a hyperactive SNS response or an overlearned survival response, we might hypothesize that survival attitude would be higher in individuals with PTSD because they are often exhibiting a survival response to environmental cues. As a result, their survival attitude might be activated more frequently as well.

Conversely, some qualities of PTSD seem in conflict with the qualities of survival attitude. We know a number of factors that are protective against PTSD, and some of these overlap with the elements of survival attitude. For example, optimism has been shown to be a protective factor against PTSD in a variety of situations (Ai, Evans-Campbell, Santangelo, & Cascio, 2006; Carver et al., 1998; Scheier et al., 2001). Another factor that has been found in several studies to be protective of PTSD is the concept of hardiness. This has been measured using the Kobasa Hardiness Scale, which measures the dimensions of commitment, control, and challenge (Agaibi & Wilson, 2005). Locus of control was another factor shown to be protective against PTSD symptoms. It’s possible that some of the characteristics that make up a survival attitude, such as perseverance, taking control, and optimism/hope, overlap with characteristics
that protect against PTSD. In this case, we would expect that the SAS would be negatively correlated with PTSD.

Although PTSD is a disorder that occurs in the period following a traumatic event, survival attitude is concerned with the response that occurs during an emergency situation. There is virtually no literature on the psychological responses that occur during a traumatic event. In the present research, self-reports of elements of PTSD are considered as an aspect of participants’ previous trauma experiences. Relationships between self-reported PTSD, survival attitude, and survival response strategies in an active shooter situation are examined.

**Survival Attitude and Resilience**

Resiliency is defined as the ability to cope with, overcome, or recover from trauma, deprivation, adversity, threat or stress (Meredith et. al, 2011; Park, Cohen, & Murch 1996). Bonanno, Galea, Bucciarelli, and Vlahov (2007) use an expanded definition in which resilient individuals experience relatively little negative impact of a traumatic event and may experience growth following it. Bonanno further makes a distinction between recovery, in which a person experiences some negative impact of a trauma or loss and then returns to normal functioning, and resiliency, in which people remain relatively stable in spite of a trauma or loss (2004). He states that resiliency is the most common response to trauma (Bonanno, 2005).

Some researchers define resiliency as a process, some define it as an outcome, others describe it as a dynamic state (Almedom & Glandon, 2007). Some equate it to post-traumatic growth and some equate it to the absence of PTSD (Almedom & Glandon, 2007). There are a number of factors that promote resilience, some of which are out of an individual's control such as supportive social relationships and family cohesion (Bonanno, 2005). Bonanno (2004) described four pathways to resilience, and suggested that hardiness, self-enhancement, repressive
or pragmatic coping, and positive emotion and laughter as major resiliency factors. The personality trait of hardiness consists of finding meaningful purpose in life, belief in the ability to influence one’s surroundings and the outcomes of events, and a belief that one can grow from both positive and negative life experiences. Self-enhancement is defined as a positive bias toward oneself that may result in high self-esteem or narcissism. Repressive coping is a style of emotional coping in which individuals may repress or avoid unpleasant, thoughts, emotions, or memories. Positive emotion and laughter work to reduce distress during stressful life situations and undoing negative emotions (Bonanno, 2004).

The concept of hardiness appears to be both a protective factor against PTSD and a way to achieve resiliency. Again, this is similar to the survival attitude concepts of taking control and perseverance. Also, positive emotion and laughter are both important in both resilience and survival attitude. At the same time, some of the factors seem at odds with those with a survival attitude, such that survival attitude may involve individuals being selfish while resilient individuals are typically higher in altruism (Meredith et. al, 2001). In the present study, participants’ scores on the Survival Attitude Scale were compared to scores on the Connor-Davidson Resilience Scale to explore relationships between the two constructs. Based on the overlap in characteristics between survival attitude and resilience, it was hypothesized that the SAS will have a positive correlation with the Connor-Davidson Resilience Scale.

**Existing Literature on Survival Attitude**

Although every effort was made to thoroughly review research literature related to the psychology of survival for the present study, a sizable amount of existing literature is not grounded in empirical research. The present literature review included books, articles published in non-academic journals, along with any relevant empirical work from various disciplines.
published in standard academic journals related to the topic. Writings from online sources such as blogs or non-academic internet journals were not used in the present literature review. It should also be noted that authors of sources used in the present literature review include journalists, survival experts, military and police personnel, in addition to work by any academic scholars relevant to the topic of survival attitude.

Literature on the prevalence of mass shootings and police response comes from academic journals, reports of incidents, and special committees formed to examine these types of events. For example, the present review references a paper discussing the impact of mass shootings on gun policy (Luca, Malhotra, & Poliquin, 2016) published online in the Harvard Business School working papers. This well respected work on social policy and gun violence did not go through the peer review process. In the present literature review, reports from relevant organizations were used such as the Police Executive Research Forum (Police Executive Research Forum, 2014), a nonprofit organization that conducts research to publish reports, conducts management studies of law enforcement agencies, provides police education trainings, and hosts a number of free publications. Given the paucity of existing scholarly research, the importance and timeliness of the topic area, and the critical need for basic research, both academic and non-academic sources were used in the present study to establish a grounding for the present empirical research.
THE PRESENT STUDY

Survivor characteristics, including psychological attributes that may increase an individual’s chances of survival, have been the subject of various disaster response theories and have received attention in many survival handbooks. Using a sample of adults, the present study examines the psychometric properties, psychological correlates, and potential usefulness of the Survival Attitude Scale (SAS), a newly developed measure of factors related to survival during a disaster situation. Items for the 23 item self-report measure of survival attitude were generated based on factors related to survival attitude discussed in the literature on disaster preparedness and response. In the present study, items scores on the SAS underwent principal components factor analysis to examine the structure of the measure and basic psychometric properties of the measure were examined.

To help to establish the construct validity of the measure, correlations between scores on the SAS and other self-report measures were examined. It was expected that the SAS would be moderately correlated with measures of an individual's ability to cope well with making a decision (Melbourne Decision Making Questionnaire - MDMQ), their perceived control over threatening events and reaction to threat (Anxiety Control Questionnaire - ACQ), and self-reported optimism (Life Orientation Test Revised - LOT-R). Discriminate validity was examined by comparing scores on the SAS to measures of self-esteem and social desirability. We expected the SAS to have low correlations with measures of self-esteem (Rosenberg Self Esteem Scale) and be uncorrelated with an individual's desire to be seen as socially desirable (Marlow- Crown Social Desirability Scale). To establish criterion validity for the measure, participants’ scores on the SAS were compared to overall performance on a short vignette depicting an active shooter situation on a university campus.
The present study explores relationships between scores on the SAS and scores on self-report measures of previous trauma experience (Life Events Checklist and PTSD checklist) and resilience in an attempt to situate the concept of survival attitude in a larger nomological network of relevant constructs.

Scores on the SAS were compared to scores on self-report measures of disaster experience (Life Events Checklist), Post Traumatic Stress Disorder (PTSD Checklist – 5), and resiliency (Connor-Davidson Resilience Scale 25 (CD-RISC-25)). Since individuals who have experienced multiple life-threatening events are thought to have greater experience in potential survival situations, it was hypothesized that scores on the SAS would be positively correlated with scores on the Life Events Checklist. Given the conceptual overlap between resiliency and survival attitude, scores on the SAS and Connor-Davidson Resilience Scale 25 were expected to be positively correlated.

Hierarchical multiple regression analyses were then conducted to examine the relative contribution of scores on the SAS in predicting scores on the survival response strategies vignette. Specifically, total scores on the survival response strategies vignette served as the criterion variable in the regression equation. Demographic characteristics, self-reports of past disaster experience, and scores on the Melbourne Decision-Making Questionnaire, Anxiety Control Questionnaire, Life Orientation Test, Rosenberg Self-esteem Scale, PTSD Checklist, Life Events Checklist, and the Survival Attitude Scale were entered into the regression equations to examine the relative contribution of factors in predicting performance scores on the survival response strategies vignette. Three hierarchical multiple regression analyses were conducted to examine the contribution of SAS scores to variation in scores on the survival response strategies vignette. To determine which variable served as a better predictor for survival
response strategies, three additional hierarchical multiple regression analyses were conducted to examine the contribution of the Connor-Davidson Resilience Scale scores to variation in scores on the survival response strategies vignette.
METHOD

Sample Characteristics

The present sample consisted of 401 adults (235 women; 164 men, 1 transgender, and 1 gender fluid individual) living in the United States. Descriptive information about the sample is presented in Table 1. Participants were primarily Caucasian ($n = 317, 79\%$), married ($n = 192, 48\%$) and considered themselves to be Atheist/Agnostic ($n = 117, 29\%$). Participants ranged in age from 18 to 65 years old, with an average age of 37 ($SD = 11.5$). Most participants identified as White ($317; 79.1\%$), with 20 people ($5.0\%$) identifying as Black, and 64 people ($16.0\%$) who identified as being from other racial/ethnic groups. The sample was largely married ($47.9\%; n = 192$), with 40.1% of the sample ($n = 161$) reporting being single/never married, and 48 participants ($12.0\%$) indicating that they were either separated, divorced, or widowed. Eight and a half percent ($n = 34$) of participants reported that they had done military service.

In terms of their previous emergency disaster experiences, 20.2% of sample participants ($n = 81$) reported that they had been involved as a disaster/emergency volunteer in the past, and 19.5% ($n = 78$) of the sample stated that they had emergency training beyond basic CPR and First Aid. Almost half of the sample ($45.6\%; n = 183$) reported stated that they had experienced an emergency/disaster as a person affected by the emergency/disaster. When asked how confident participants were that they would know what to do in an emergency if one occurred tomorrow, 9.7% ($n = 39$) were “very confident” that they would know how to respond, 29.9% ($n = 120$) were “confident,” 47.1% ($n = 189$) were “somewhat confident,” and 13.2% ($n = 53$) were “not very confident” that they would know how to respond.
Procedure

A web-based recruitment and data collection procedure was used (Amazon.com Mechanical Turk (MTurk)) to obtain participants for the present study. Participants were recruited for this research using an online posting of research experiments available through an invitation to participate on MTurk. Individuals received $1.00 for their participation. Adults living in the United States, who spoke English, and were between the ages of 18 – 65 years old were eligible to participate in the research. Six questions on the survey were used as “attention checks” to verify that participants were attending to the content of survey items on MTurk as recommended by previous researchers (Mason & Suri, 2012). These attention items (Appendix N) required participants to provide obvious or factual responses (e.g. “Which answer below begins with the letter E?”) to items. Individuals were not included in the final sample if they responded incorrectly to two or more attention check items. Of the 490 individuals who initially responded to the MTurk survey, the responses of 60 individuals were eliminated for not meeting the attention check criteria. In addition, the responses of 29 individuals were eliminated from the sample due to substantial missing data.

Adults read a brief description of the study including study requirements before agreeing to participate. At the time that they logged in online to participate, they read and electronically signed an informed consent form (Appendix C). At the completion of this survey, participants read a short statement thanking them for their participation and debriefing them as to the goals of the research. Finally, participants were able to obtain compensation for their participation. The questionnaire began with self-report questions about participants’ demographic characteristics (Appendix D), followed by the SAS (Appendix E) and the survival response strategy vignette
(Appendix F), and other self-report measures (Appendices G - M). Spread throughout the survey were six questions that served to check the attention of the participant (Appendix N).

**Mturk Data Collection**

Research is beginning to consider the question of whether MTurk participant samples provide reliable and generalizable data. Huff and Tingley (2015) compared a sample of 2,706 MTurk participants to a sample of 1,300 participants collected from the Cooperative Congressional Election Survey (CCES), which is considered a benchmark for data collection in political science literature. Results from this comparison suggest that, compared to the CCES, MTurk had increased participation from some groups (young Hispanic females and young Asian males and females), generally similar voting patterns, partisan preferences, news interest, and education in a younger sample of respondents on the CCES, a small (no larger than 7%) difference in employment sectors, and 90% of participants from urban areas which is identical to CCES participants. An article by Paolacci and Chandler (2014) raised the issue of selection bias due to participant’s self-selecting to participate in studies. Their review of past literature regarding data quality on MTurk found that participants generally provided quality responses and tended to be higher on social desirability than other participants pools. Data quality increased with payment but not with the use of post screening methods (Paolacci and Chandler, 2014). Casler, Bickel, and Hackett (2013) compared crowdsourced (including MTurk, Facebook, Twitter, and Reddit) and social media participants to in-lab recruits on effectiveness in equivalent tasks and diversity in participant samples, and found that participants in an online adaptation of a lab test scored equivalently and that participants were significantly more diverse than in-lab samples.
The question of data quality is another issue raised with MTurk participant samples. Some studies are finding sufficient data quality with online samples (Casler, Bickel, & Hackett, 2013; Paolacci & Chandler, 2014). However, a number of studies have employed strategies for ensuring data quality in the past. The MTurk Requester Best Practices Guide (June 2011 update) provides suggestions for methods to ensure data quality, that includes the use of attention check questions.

Mason and Suri (2012) suggest a variety of types of attention check questions, such as captcha-type questions that require participants to write the president's name in a box, for psychological studies that do not “correct” answers. Other suggested types were the addition of questions with correct answers, such as “What is 2 + 2?” (Mason & Suri, 2012). In a study by Kittur, Chi, and Suh (2008), using these types of questions increased data quality, with invalid responding dropping from 48.6% to 2.5%. Other research suggests that attention check questions are unnecessary at best and deter some workers from studies that use them. In the present research, the inclusion of attention check questions served as a way to potentially increase data quality, where participant data were not used if two or more attention check questions were missed.

**Measures**

**Survival Attitude Scale (SAS)**

The Survival Attitude Scale (SAS) is a newly developed measure for the present study designed to assess adults’ survival attitude, which is expected to be related to the effectiveness of individual’s response during an emergency situation. The SAS is grounded in survival literature from a variety of disciplines that include psychology research, military and police research, and journalism related to survival, with a particular focus on writings that describe psychological
aspects of survival in crisis/emergency situations. Additionally, concepts such as the “will to live” and “survival instinct” as well as “human factors in survival” found in the psychology and survival literature are reflected in generating items for the SAS. The literature review included peer-reviewed research articles on survival as well as survival books and manuals. Literature from a first-person perspective of survivors was excluded, as were articles describing a single survival incident, or multiple incidents without an attempt to glean larger survival themes across incidents. Items generated for the measure reflect current literature regarding the psychological traits that contribute to survival in stressful life circumstances.

An initial pool of 50 items was generated from a review of relevant literature. Similar or redundant items were then eliminated and a measure containing 25-items was pilot tested on a group of 22 doctoral students in clinical psychology. The SAS was further refined based on feedback from the pilot testing. A 23-item SAS measure was reviewed by a set of five experts in law enforcement who have extensive experience in emergency response. Feedback about the measure by law enforcement experts was incorporated into the final version of the SAS. In the end, five survival attitude categories were identified: Taking Control, Threat Assessment and Decision Making, Emotional Control, Self-preservation, and Positivity. See Table 2 for definitions.

In the instructions, participants are asked to imagine that they are in a serious emergency situation and determine the degree to which they agree or disagree that they would engage in a potential response to the situation. Responses are on a five-point Likert scale ranging from “Strongly disagree” scored as 1 point, to “Strongly agree” scored as 5 points. Six items are reverse scored. Items are presented in random order in the online survey. Participants can score between 23, indicating a low score of survival attitude, to 75, indicating a high survival attitude.
score. Higher scores on SAS indicate a greater likelihood that an individual will engage in behaviors that will contribute positively to the individual's survival in an emergency situation. The SAS takes approximately 10 minutes to complete.

**Survival Response Strategies Vignette**

To help establish criterion validity of the SAS, a survival response strategies vignette was created for the present study as a measure to depict an active shooter situation on a college campus. The measure was designed in consultation with experts in law enforcement who have extensive experience in responding to emergency situations. The survival response strategy vignette is based on literature that describes the recommended response of individuals caught in active shooter situations on campus (“Run, Hide, Fight”) as used by The Department of Homeland Security (2016), the Federal Bureau of Investigation (n.d.), Ready Houston (n.d) and the Mayo Clinic (n.d.). Four experts in law enforcement were asked to provide feedback regarding the scoring of the survival response strategy vignette. Scoring was altered based on feedback about best/correct responses to the vignette by law enforcement experts.

In the survival response strategy vignette, participants read a five paragraph vignette depicting a sequence of events involving an active shooter on a college classroom. After each paragraph, participants are asked to select which of five possible responses best describes how they would respond to the situation described. Each response choice is scored based on the “Run, Hide, Fight” paradigm with a passive response scored as “0”, an active response scored as “1”, or a recommended paradigm response scored as “2.” Not all items included a response that could be scored as “2” if the “Run, Hide, Fight” scenario did not have a specific suggestion for that scene. Item responses are presented in random order in the online survey. Scores on the survival response strategy vignette range from 0 to 8, with higher scores on the vignette.
indicating responses consistent with recommended responses for increasing likelihood of survival in a campus shooter situation. To reduce response bias from test order, the SAS and the survival response strategy vignette appeared in random order for participants.

**Convergent Validity Measures**

*Melbourne Decision Making Questionnaire (MDMQ).* The Melbourne Decision Making Questionnaire is a 22-item scale that designed to measure decision-coping patterns, or the pattern of coping with the stress generated by making a decision (Mann, Burnett, Radford, & Ford, 1997). Overall scores range from 0 to 44. The item analysis suggested four factors: vigilance, hypervigilance, buck-passing, and procrastination, which are considered the major patterns of decision making style (Mann, Burnett, Radford, & Ford, 1997). Vigilance is considered an adaptive coping strategy in which individuals search for and evaluates cues relevant to the threat. Vigilance requires awareness of the risks of alternatives, hope of finding a better alternative, and time to search and deliberate before making a decision. Procrastination is avoidance of making a decision, buck-passing consists of distorting the information selection or processing, or deferring the decision to others, and hypervigilance is a quick decision made as a result of panic or rushed decision making. Participants are asked to answer items on a three-point scale of, “not true for me,” “sometimes true,” and “true for me.” It has been validated in several countries, and tests of reliability of subscales in different countries have shown the following Cronbach’s alphas: vigilance 0.65–0.80; hypervigilance 0.61–0.74; buck-passing 0.77–0.87; and procrastination 0.70–0.81 (Isaksson, Hajdarević, Jutterström, & Hörnsten, 2014). Internal consistency of the scales for this study were vigilance 0.76; hypervigilance 0.78; buck-passing 0.87; and procrastination 0.85.
Anxiety Control Questionnaire (ACQ). To assess perceived control over threatening events and reactions to threat, participants will complete the Anxiety Control Questionnaire (ACQ). The ACQ is also useful in that it has been shown to be “associated with the tendency to interpret ambiguous information in a threatening way” (Lang & McNiel, 2006, p 108). The ACQ is a 30-item self-report measure that assesses anxiety by asking participants to rate how much each statement relates to them. Response options range from 0 (“Strongly Disagree”) to 5 (“Strongly Agree”). Scores are determined by summing the scores for each item; higher scores are indicative of increased levels of anxiety (Lang and McNiel, 2006). Internal consistency of the scale was between .82 and .89 and the correlation coefficient for anxiety and stress ranged from -.46 to -.51 (Zebb & Moore, 1999). Internal consistency of the scale for the present study was .93.

Life Orientation Test – Revised The Life Orientation Test – Revised (LOT-R) is a 10-item measure designed to assess optimism in participants (Scheier, Carver, & Bridges, 1994). The LOT-R consists of 10 statements, three of which are filler statements, using a response format ranging from 0 (“Strongly Disagree”) to 4 (“Strongly Agree”). Higher scores on this measure indicate higher levels of optimism in participants (Scheier, Carver, & Bridges, 1994). In previous research, the LOT-R was demonstrated to possess high internal consistency (α = .76 in a undergraduate student sample; Scheier, Carver, & Bridges, 1994). Internal consistency of the scale for the present study was .92.

Discriminant Validity Measures

Rosenberg Self-Esteem Scale The Rosenberg Self-Esteem Scale (RSES) is a 10-item self-report measure designed to assess global self-esteem. Participants are asked to rate their agreement with statements designed to assess their overall feelings of self-worth and acceptance using a four-point scale ranging from 0 (Strongly Disagree) to 4 (Strongly agree). Higher scores
on the scale reflect higher levels of self-esteem. A variety of studies have demonstrated high levels of reliability and validity across a number of samples and groups (Brems & Lloyd, 1995). For the present study, the Cronbach’s alpha for this scale was .94.

**Marlowe-Crowne Social Desirability Scale, Short Form** The Marlowe-Crowne Social Desirability Scale is used to assess socially desirable reporting of participants. In the full form, the scale contains 33 statements and participants must consider whether each statement applies to them using a true-false scale. Strahan and Gerbasi created a short form of the scale that has high internal consistency ($\alpha = .88$) and high correlation with the standard scale ($r = .96$; 1972; as cited in Fischer & Fick, 1993). The Marlowe-Crowne Social Desirability Scale, Short Form is a ten item measure that follows the true-false scoring method of the longer version. High scores on the scale indicate that the participant is responding in a socially appropriate way. In the present study, the internal reliability of the Marlowe-Crowne Social Desirability Scale was .69.

**Previous Trauma and Resilience Measures**

**PTSD Checklist for DSM-5 (PCL-5).** The PTSD Checklist for DSM-5 was used to check for associations between PTSD symptoms and scores on the SAS. It is a 20-item measure designed to screen for symptoms of PTSD (Weathers, Blake, Schnurr, Kaloupek, Marx, & Keane, 2013). Although the PTSD Checklist is not typically considered an appropriate tool for diagnosing PTSD in and of itself, it is useful for determining whether additional screening must be completed and providing a provisional diagnosis. Participants are asked to indicate the extent to which they have experienced a particular symptom and responses are measured on a 5-point Likert scale from 0 ("Not at all") to 4 ("Extremely"). Scoring is done by summing the items, and scores range from 0 to 8. Additionally, symptoms clusters may be examined by summing scores related to the four symptom clusters (intrusion, avoidance, negative alterations in cognitions and
mood, and alterations in arousal and reactivity; Weathers, Blake, Schnurr, Kaloupek, Marx, & Keane, 2013). Internal consistency of the scale for the present study was .95.

**Life Events Checklist (LEC).** To assess the real-life emergency experiences that participants may have experienced, this research will utilize the Life Events Checklist. This scale asks participants to designate whether they have experienced sixteen potentially traumatizing life events and asks them to rate the way in which they experienced the event. For example, a participant would mark whether the event “happened to me,” or they “witnessed it,” or “learned about it,” or were exposed to the event “as part of my job.” Internal consistency of the scale for the present study was .86.

**Connor-Davidson Resilience Scale (CD-RISC).** The Connor-Davidson Resilience Scale is a 25-item measure that assesses successful coping ability (Connor & Davidson, 2003). For this study, the measure was used to explore the relationship between survival attitude and coping ability. CD-RISC items are on a five-point Likert Scale, with responses from 0 (“Rarely true”) to 4 (“Nearly true all of the time”). Higher scores reflect greater resilience. The mean score was 31.8 (SD = 5.4; Campbell-Sills, Forde, Stein, 2009). Connor and Davidson (2003) reported that evidence for convergent validity for the 25-item measure was demonstrated by the positive relationship between the CD-RISC and the Kobasa (1979) hardiness measure. The CD-RISC 25-item also demonstrated a negative relationship with the Sheehan Stress Vulnerability Scale (SVS; Sheehan, 1983). Internal consistency of the scale for the present study was .94.
RESULTS

Demographic Differences

Prior to assessing the main research questions, statistics on demographic characteristics of the sample were calculated, including t-tests, chi-square, and Pearson correlations to examine demographic differences on main study variables. Descriptive statistics for main study variables are found in Table 3.

Age

There was a significant positive correlation between age and scores on the survival response strategy vignette with older individuals reporting higher survival response strategy vignette scores ($r = .22$, $n = 401$, $p < .001$). There was no significant correlation between participants’ reports of their age and scores on the SAS ($r = -.02$, $n = 401$, $p = n/s$). Age was also significantly positively correlated with measures of life orientation ($r = .15$, $n = 401$, $p < .01$), self-esteem ($r = .13$, $n = 401$, $p < .05$), and social desirability ($r = .12$, $n = 401$, $p < .05$). Older participants reported significantly higher numbers of stressful life events than younger participants ($r = .10$, $n = 401$, $p < .05$), as measured by the Life Events Checklist. There were negative correlations between participant age and scores on three subscales of the MDMQ, such that older participants had significantly lower scores on the MDMQ subscales of buck-passing ($r = -.17$, $n = 401$, $p < .01$), procrastination ($r = -.18$, $n = 401$, $p < .01$), and hypervigilance ($r = -.24$, $n = 401$, $p < .05$). No significant correlations were found between age and the MDMQ subscale of vigilance.

Gender
Independent samples t-tests were used to assess the mean differences on study variables by gender and results are displayed in Table 4. Overall, men scored significantly higher than women on both the SAS and the survival response strategy vignette. On the MDMQ decision-making scales, the only significant difference between men and women was on the Hypervigilance subscale, in which men scored significantly lower than women, suggesting that men used a better decision-making style that did not require hypervigilance. On the other main study variables, men scored significantly higher than women on measures of anxiety control, life orientation, and resilience.

**Ethnicity**

Differences in study variables were assessed as a function of ethnicity using independent samples t-tests. There were no significant differences in main study variables based on ethnicity.

**Religious affiliation**

Several religious affiliations were collapsed into three categories for Christians, Atheist/Agnostic, and Other. A series of one-way analysis of variances (ANOVAs) showed that scores on both the SAS and the survival response strategy vignette significantly differed as a function of religious affiliation ($F(2, 398) = 4.98, p < .05$ for the SAS) and ($F(2, 398) = 4.91, p < .05$ for the survival response strategy vignette). Least significant difference post hoc tests revealed that participants identifying as Atheist/Agnostic ($M = 64.13, SD = 10.59$) scored significantly lower on the SAS and the survival response strategy vignette than participants identifying as Christian ($M = 67.61, SD = 10.52$). There were no significant differences between participants identifying as any other religion and either the Atheist/Agnostic or Christian groups. In terms of decision making, results of the ANOVA suggested that participants who identified as Atheist/Agnostic were significantly different from the Christian identifying group on the MDMQ
subscale buck-passing, with the Atheist/Agnostic group having reported engaging in higher amounts of buck-passing than the Christian group \((F(2, 398) = 3.89, p < .05)\). The Atheist/Agnostic group and the Christian group also differed significantly on a measure of optimism and self-esteem, with Christians scoring higher on both measures \((F(2, 398) = 7.03, p < .05)\) and \((F(2, 398) = 9.68, p < .05)\), respectively. In addition, the Atheist/Agnostic group and the Other religious group scored significantly differently on the self-esteem measure, with the Other religious group scoring higher on self-esteem as well. Finally, participants identifying as Atheist/Agnostic scored significantly lower than the Christian group on a measure of resilience \((F(2, 398) = 9.68, p < .05)\).

Sample Characteristics and Main Study Variables

**Disaster Volunteer Experience**

A series of independent samples t-tests were conducted to determine whether differences existed between main study variables as a function of previous disaster experience as a volunteer responder. Participants who had previous disaster experience as a volunteer responder \((M = 4.44, SD = .56)\) generally scored significantly higher on the SAS than those who did not have disaster experience as a volunteer responder \((M = 4.10, SD = .64; t = -4.33, p < .001)\). Participants who had previous disaster experience as a volunteer responder \((M = 5.27, SD = 1.14)\) scored significantly higher on the survival response strategy vignette than those who did not have disaster experience as a volunteer responder \((M = 4.93, SD = 1.19; t = 2.31, p < .05)\). Participants who had previous experience as a disaster volunteer generally scored significantly higher on measures of anxiety control, optimism, self-esteem, traumatic life events, and resilience than participants who did not have previous disaster experience as a disaster volunteer. Results of these t-tests are found in Table 5.
Disaster experience as a person affected by the disaster

A series of independent samples t-tests were used to assess the mean differences on study variables between participants who were or were not affected by a disaster. Participants who had been negatively impacted by a disaster ($M = 67.04, SD = 10.32$) had significantly higher scores on the SAS than those who were not impacted by a disaster in the past ($M = 64.96, SD = 10.33, t = 2.00, p < .05$). There were no significant differences in participants’ scores on the survival response strategy vignette as a function of their reports of previous disaster experience as a person affected by the disaster. Participants who reported that they were affected by a disaster in the past generally had significantly higher scores on the Life Events Checklist ($M = 52.87, SD = 31.94$ vs. $M = 34.28, SD = 24.78$) as well as higher scores on the PTSD checklist ($M = 19.74, SD = 16.17$ vs. $M = 13.57, SD = 14.50$).

Previous disaster training as a responder

Independent samples t-tests were performed to assess whether main study measures varied as a function of disaster response training. Individuals with disaster response training generally scored significantly higher ($M = 70.29, SD = 8.29$) on the SAS than individuals without previous disaster response training ($M = 64.85, SD = 10.55, t = 4.25, p < .001$). Participants with disaster response training also generally scored significantly higher on a measure of anxiety control ($M = 103.91, SD = 16.33$ vs. $M = 96.66, SD = 24.02$), traumatic life events ($M = 57.99, SD = 35.88$ vs. $M = 39.09, SD = 26.83$), and resilience ($M = 73.92, SD = 13.44$ vs. $M = 67.96, SD = 16.49$) than those without previous disaster experience.

Trauma-related employment
To examine differences between main study variables as a function of whether participants had ever worked in a job that included responding to disaster or providing assistance to victims of disaster, independent samples t-tests were conducted. Participants who had worked in employment related to disaster response scored significantly higher on the SAS ($M = 70.38$, $SD = 8.01$) than those who did not work in disaster related employment ($M = 65.63$, $SD = 10.44$, $t = 2.19$, $p < .05$). There were no significant differences in participants’ scores on the survival response strategy vignette as a function of their previous disaster experience as a person affected by the disaster. Participants who had worked in employment related to disaster response also scored significantly higher on a measure of traumatic life events ($M = 58.04$, $SD = 38.49$) than those who had not worked in disaster related employment ($M = 41.79$, $SD = 28.86$).

**Structural Characteristics of the Survival Attitude Scale**

Before submitting items to principal components analysis, the 23 items were examined for skewness. The influence of skewed items in a Principal Components Analysis is enhanced, as the distribution of these items are not centered around the mean. A total of 7 items with a skew of .65 or above were removed from consideration (Items 10, 11, 13, 14, 15, 18, and 21) and further analysis was conducted on the remaining 16 items of the SAS.

A Principal Components Analysis with Varimax rotation was performed on the 16 items of the SAS measure. Results of the analysis yielded three components with eigenvalues greater than 1.0. The first factor accounted for 44% of the total variance, factor two accounted for 8.1% of the variance and the third factor accounted for 7.8% of the variance. Item 4 had split loadings across the three factors and was removed in subsequent analysis. Results of the Principal Components Analysis are summarized in Table 6.
The factor analysis suggested that the SAS is comprised of three factors. Factor 1, labeled “Effectiveness of Response,” consisted of ten items and reflects participants’ perceptions of overall effectiveness in individuals’ ability to cope with an emergency. Items in “Effectiveness of Response,” include statements such as, “I would make good, quick decisions under pressure,” “I would respond quickly and effectively,” and, “I would be pretty optimistic in my ability to handle the situation.” Factor 2, labeled “Relinquishing Control”, consisted of two items and reflects individuals’ willingness to turn over control of an emergency to others or to a higher power. Items that reflected “Relinquishing Control” were, “I would think about how others would deal with this situation and do the same,” and “I would use my faith to give me a sense of hope and purpose in dealing with the unexpected.” Factor 3, labeled “Self-preservation,” consisted of three items and reflects individuals’ perception that they would be selfishly focused on their own survival in response to the emergency. The three items that loaded on the “Self-preservation” subscale were: “I would be willing to do whatever it takes to make sure that I don’t get hurt,” “If other people were involved, I would be not altruistic and selfless even at my own expense,” (reverse scored) and “I would not use humor as a way to reduce tension” (reverse scored). A total mean score for the SAS and mean scores for the three subscales of the SAS were calculated. Factor scores are partial scores scaled to match the same range as the full SAS score. Internal consistency of the scale was .83.

**Construct Validity of the Survival Attitude Scale**

Pearson product-moment correlation coefficients were computed to assess the relationship between total and subscale scores on the SAS and main study variables. Intercorrelations among main study variables can be found in Table 8. As seen in the table, correlational analyses using total and subscale scores for the SAS suggest that the overall pattern
of significant correlations was not substantially different between study variables and SAS total and subscale scores. Thus, total mean scores on the SAS and main study variables are described below and used in subsequent analyses.

As expected, total mean SAS scores were found to have a significant positive correlation with scores on the survival response strategy vignette \([r(401) = .30, p < .01]\). In regard to construct validity, total mean scores on the SAS were significantly negatively correlated with the three negative aspects of decision making as measured by the MDMQ [buck-passing \(r(401) = -.41, p < .01\); procrastination \(r(401) = -.41, p < .01\); hypervigilance \(r(401) = -.43, p < .01\)]. The total mean scores on the SAS were significantly positively correlated with the positive aspect of decision making as measured by the MDMQ subscale of vigilance \([r(401) = .26, p < .01]\). SAS scores were also significantly positively correlated with aspects of personality as indicated by scores on measures of anxiety control \([r(401) = .61, p < .01]\), optimism \([r(401) = .42, p < .01]\), and self-esteem \([r(401) = .43, p < .01]\). Total SAS scores had a small, but significant positive correlation with scores on a measure of social desirability \([r(401) = .15, p < .01]\).

There was a small, but significant negative correlation between SAS scores and PTSD scores \([r(401) = -.10, p < .05]\). There was a large and significant correlation between SAS scores and scores on the Connor-Davidson Resilience Scale \([r(401) = .70, p < .01]\). Further inspection of the content of items on the SAS and Connor-Davidson Resilience Scale revealed overlap in the content of items (see Table 7 for a comparison of items of the two scales).

Scores on the survival response strategy vignette were significantly correlated with the negative symptom scales of the Melbourne Decision Making Questionnaire (MDMQ). Specifically, buck-passing had a correlation of \(r(401) = -.30, p < .01\), procrastination was \(r(401)\)
= -.27, \( p < .01 \), and hypervigilance was \( r(401) = -.31, p < .01 \). The positive symptom scale of the MDMQ, vigilance, had a correlation of \( r(401) = .06 \) that was not significant.

Scores on the survival response strategy vignette were also significantly correlated with a measure of anxiety control \( [r(401) = .26, p < .01] \). As for the relationship with personality variables, scores on the survival response strategy vignette were significantly correlated with scores on optimism \( [r(401) = .16, p < .01] \) and self-esteem \( [r(401) = .18, p < .01] \). Scores on the survival response strategy vignette were not significantly correlated with scores on the PTSD scale or the Life Events Checklist. Scores on the Connor-Davidson Resilience Scale were significantly positively related to scores on the survival response strategy vignette \( [r(401) = .25, p < .01] \). Further exploratory analyses related to the Connor-Davidson Resilience Scale, the SAS, and the survival response strategy vignette will be described later in the results section.

**Factors Accounting for Variation in Survival Response Strategy Vignette Scores**

Three separate hierarchical multiple regression analyses were conducted to assess the relative contribution of the SAS in accounting for variation in scores on the survival response strategy vignette beyond that of demographic variables, previous emergency experience, and perceived decision-making ability, previous trauma, and personality characteristics. Since there was no theoretical justification for the relative importance of decision making ability, previous trauma, and personality characteristics in predicting scores on the survival strategies vignette, it was not possible to include all of these factors in a single regression analysis. Therefore, three separate hierarchical multiple regressions were conducted to examine the ability of scores on the SAS to predict variation in survival response strategy vignette scores beyond that of 1) perceived decision-making ability (first regression analysis), 2) self-reported previous trauma (second regression analysis), and 3) self-reported personality characteristics (third regression analysis).
In each of the three regression analyses, scores on the survival response strategy vignette served as the criterion variable. In each of the three regression equations, demographic variables of age, gender (male = 1, female = 0), and religious affiliation (Atheist/Agnostic = 1, all other = 0, and Christian = 1, all other = 0) were entered in Step 1, and previous emergency involvement as a responder (previous involvement = 1, none = 0) was entered in Step 2. The first regression analysis examined that ability of SAS scores to predict variation in survival response strategy vignette beyond that of demographic variables, previous emergency involvement and scores on self-reported decision-making ability (MDMQ). In the first regression equation, MDMQ subscale scores were entered in Step 3 of the equation, and SAS scores were entered in Step 4 of the equation.

Results of the first regression analysis are summarized in Table 9. The overall model predicting survival on the survival response strategy vignette was significant: $F(10, 388) = 9.00, p < .001, R^2 = .19, \text{ Adj. } R^2 = .17$. Demographic variables entered in the first step of the regression model accounted for a significant portion of the variance in survival scores ($\Delta R^2 = .08, p < .001$). For individual demographic variables, higher age was associated with higher survival scores ($\beta = .19, p < .001$), as was gender with males having higher survival scores ($\beta = .14, p < .01$), and religion was for atheists/agnostics, who had lower survival scores ($\beta = -.13, p < .05$). The second step of the regression model, participant’s previous experience as an emergency volunteer or responder accounted for a significant amount of the variance in survival scores ($\Delta R^2 = .01, p < .001$). On the third step of the equation, decision-making accounted for a significant amount of the variance in survival scores ($\Delta R^2 = .08, p < .001$). Of the four MDMQ subscales, two were significantly related to survival scores: lower buck-passing was associated with higher survival scores ($\beta = -.13, p < .05$) and lower hypervigilance was associated with higher survival scores ($\beta$
In the final level of the regression analysis, higher scores on the SAS ($\beta = .18, p < .001$) were associated with higher scores on the survival response strategy vignette. As hypothesized, SAS accounted for a small, but significant amount of the variance in survival response strategy vignette scores ($\Delta R^2 = .02, p < .001$; see Table 9), above that accounted for by demographic variables, descriptive variables, and decision-making variables.

The second regression analysis examined the ability of SAS scores to predict variation in survival response strategy vignette scores beyond that of demographic variables, previous emergency involvement and self-reports of previous trauma (via the Life Events Checklist and PTSD measures). Again, in the second regression equation, demographic variables of age, gender (male = 1, female = 0), and religious affiliation (Atheist/Agnostic = 1, all other = 0, and Christian = 1, all other = 0) were entered in Step 1, and previous emergency involvement as a responder (previous involvement = 1, none = 0) was entered in Step 2, scores on the Life Events Checklist and PTSD measures were entered in Step 3 of the equation, and SAS scores were entered in Step 4 of the equation. For this regression analysis, the overall model predicting survival on the survival response strategy vignette was significant: $F(10, 389) = 9.58, p < .001$, $R^2 = .164$, Adj. $R^2 = .15$. Again, demographic variables entered in the first step of the regression model accounted for a significant portion of the variance in survival scores ($\Delta R^2 = .08, p < .001$) and participants’ previous experience as an emergency volunteer or responder in the second step of the equation accounted for a significant amount of the variance in survival scores ($\Delta R^2 = .01, p < .001$). On the third step of the equation, previous trauma variables (PTSD Checklist and Life Events Checklist) accounted for a significant amount of the variance in survival scores ($\Delta R^2 = .01, p < .001$). In the final level of the regression analysis, higher scores on the SAS ($\beta = .264, p < .001$) were associated with higher scores on the survival response strategy vignette. As with the
previous regression analysis, SAS accounted for a small, but significant amount of the variance in survival response strategy vignette scores ($\Delta R^2 = .063, p < .001$), above that accounted for by demographic variables, descriptive variables, and previous trauma variables. Results of the second regression analysis are found in Table 10.

The third regression analysis examined the ability of SAS scores to predict variation in survival response strategy vignette scores beyond that of demographic variables, previous emergency involvement, and self-reported personality characteristics. In the third regression equation, demographic variables were entered in Step 1, and previous emergency involvement as a responder (previous involvement = 1, none = 0) was entered in Step 2, scores on measures of personality characteristics (self-esteem, optimism, and anxiety control) were entered in Step 3 of the equation, and SAS scores were entered in Step 4 of the equation. The overall model predicting survivals scores on the survival response strategy vignette was significant: $F(8, 390) = 8.53, p < .001, R^2 = .17, \text{Adj. } R^2 = .15$. As in the previous models, demographic variables entered in the first step of the regression model accounted for a significant portion of the variance in survival scores ($\Delta R^2 = .08, p < .001$) and participant’s previous experience as an emergency volunteer or responder in the second step of the equation accounted for a significant amount of the variance in survival scores ($\Delta R^2 = .01, p < .001$). On the third step of the equation, personality variables accounted for a significant amount of the variance in survival scores ($\Delta R^2 = .05, p < .001$). Of the three scales (Anxiety Control Questionnaire, Life Orientation Test, and Rosenberg Self-Esteem Scale) only the ACQ was significantly related to survival scores such that higher anxiety control was associated with higher survival scores ($\beta = .25, p < .001$). In the final level of the regression analysis, higher scores on the SAS ($\beta = .23, p < .001$) were associated with higher scores on the survival response strategy vignette. Again, as hypothesized,
SAS accounted for a small, but significant amount of the variance in survival response strategy vignette scores ($\Delta R^2 = .03, p < .001$), above that accounted for by demographic variables, descriptive variables, and personality variables. Results of the third regression analysis are found in Table 11.

**Comparing the Survival Attitude and Resilience Measures**

The high correlation between the SAS measure and the Connor-Davidson Resilience scale ($r(401) = .70, p < .01$) warranted further examination regarding the possible overlap between the two measures. Exploring the degree to which scores on the resilience scale could predict scores on the survival response strategy vignette measure is important in understanding whether resilience is a better predictor of survival scores than was survival attitude.

Three additional hierarchical regression analyses were conducted to explore the relative contribution of scores on the Connor-Davidson Resilience scale in predicting scores on the survival response strategy vignette measure beyond that of demographic factors and previous emergency experience. In each of the three regression analyses, scores on the survival response strategy vignette served as the criterion variable. Step 1 (demographic information) and Step 2 (previous emergency involvement as a responder) were identical to previous regression models for all three additional regression analyses. In regression four, scores on decision making ability (the MDMQ subscales) were entered in Step 3, and scores on the resilience scale were entered in Step 4. In regression five, scores on self-reported previous trauma experience (from the PTSD Checklist and the Life Events Checklist) were enterd in Step 3, and scores on the resilience scale were entered in Step 4. In regression six, scores on self-reported personality characteristics (self-
esteem, optimism (Life Orientation Test), and anxiety control) were entered in Step 3, and the resilience scale scores were entered in Step 4.

Results of regression four show that the overall model predicting survival on the survival response strategy vignette whole accounting for demographic variables, previous disaster experience, decision making using the MDMQ, and resilience was significant: $F(10, 388) = 7.78$, $p < .001$, $R^2 = .17$, Adj. $R^2 = .15$. In the final step of the regression analysis, scores on the resilience scale did not account for a significant amount of the variance in survival response strategy vignette scores ($\Delta R^2 = .065$, $p = n/s$), above that accounted for by demographic variables, descriptive variables, and decision-making variables. (See Table 12.)

Results of regression five, which examined the ability of resilience scores to predict variation in survival response strategy vignette scores beyond that of demographic variables, previous emergency involvement and self-reports of previous trauma (via the Life Events Checklist and PTSD measures), indicate that the overall model predicting survival on the survival response strategy vignette was significant: $F(8, 390) = 7.15$, $p < .001$, $R^2 = .13$, Adj. $R^2 = .11$. In this regression equation, previous trauma variables (PTSD Checklist and Life Events Checklist) accounted for a significant amount of the variance in survival scores ($\Delta R^2 = .01$, $p < .001$), and in the final step of the analysis, higher scores on the resilience scale ($\beta = .18$, $p < .001$) were associated with higher scores on the survival response strategy vignette. Resilience scores accounted for a small, but significant amount of the variance in survival response strategy vignette scores ($\Delta R^2 = .03$, $p < .001$), above that accounted for by demographic variables, descriptive variables, and previous trauma variables. (See Table 13.)

Results of regression six, that examined the ability of resilience scores to predict variation in survival response strategy vignette scores beyond that of demographic variables, previous
emergency involvement, and self-reported personality characteristics, indicated that the overall model predicting survival scores on the survival response strategy vignette was significant: $F(9, 389) = 7.01, p < .001, R^2 = .14, \text{Adj. } R^2 = .12$. In the final step of the regression analysis, resilience scores did not account for a significant portion of the variance in survival scores above that accounted for by demographic variables, descriptive variables, and personality variables. (See Table 14).

When comparing the results of the hierarchical linear regression for the SAS to the results of the hierarchical linear regression for the resilience scale, the resilience scale did not mirror the results of the SAS. Resilience was a significant variable when used in the model with previous traumatic experiences, but not in the models with decision making or personality variables. SAS was a significant variable in all three instances, explaining a small, but significant amount of variance in survival response strategy vignette scores over and above demographic variables, previous disaster experience, and the main study variables.
DISCUSSION

The present study examined the concept of survival attitude during a crisis/emergency situation in a sample of 401 adults living in the United States. Based on existing literature in emergency response, trauma, resilience, and survival, the Survival Attitude Scale (SAS), a self-report measure of survival attitude during a crisis, was developed for the present study and its psychometric properties examined. The study examined structural aspects of the SAS and its relationship to demographic characteristics, measures of perceived decision-making ability (buck-passing, procrastination, and hypervigilance), perceived trauma experience (PTSD, life events), and aspects of personality (self-esteem, optimism, anxiety control). Participants’ scores on the SAS were also compared with scores on a measure of resilience in an attempt to place the concept of survival attitude in a larger network of relevant constructs. The relative contribution of demographics, previous disaster experience, perceived decision-making ability, previous trauma, personality factors, and survival attitude in accounting for variation in survival response strategies in an active shooter situation was examined.

Survival Attitude Relationships

Overall, findings suggest that aspects of survival attitude as measured by the SAS include perceived confidence in effectiveness of response, relinquishing control to others, and self-preservation. However, the present study used a total mean score for the SAS given low internal consistency coefficients for two of the subscales and the similarity of associations between total SAS scores and subscale scores with main study variables. The SAS demonstrated acceptable psychometric properties and evidence of construct validity. Scores on the SAS contributed to accounting for variation in survival response strategies beyond that of demographic factors (age, gender, religious affiliation), previous disaster experience, and scores on measures of decision-
making ability, previous trauma, and personality characteristics. Scores on the SAS and the Connor-Davidson Resilience scale were moderately positively correlated, but overall, SAS scores were better predictors of scores on a vignette of survival response strategies than were scores on the Connor-Davidson Resilience scale.

As a discipline, psychology has surprisingly little to say about factors that may be related to survival during a crisis emergency situation. A review of literature from disciplines that include disaster response, trauma, survival, disaster psychology, and training for military and first responders revealed some overlap but relatively little agreement about factors that may contribute to survival during a crisis. Items of the SAS were initially generated to represent factors described in various literatures that included threat assessment and quick decision making abilities (Watson, 2005; Kinsey, Gaela, & Lawrence, 2010), skill in controlling the physical setting (Leach, 1994; Sherwood, 2009), self-preservation values (Nardini 1952, Sherwood, 2009; Stroud, 2011), capacity to control emotions (Sherwood, 2009; Siebert, 2007; Stroud, 2011), and faith and hopefulness (Chang, 2001; Jackson, 1992; Watson, 2005; Wilkes, O’Baugh, Luke & George, 2003, Wiseman, 2003). Although the results of principal components analysis suggested a three-factor solution, subsequent correlational analyses suggest that subscale scores based on these factors provided relatively little descriptive utility over a total survival attitude score.

In terms of psychometric properties of the SAS, the total mean SAS score showed relatively high internal consistency among items. Contrary to expectations the SAS showed a small, but significant positive correlation with scores on a measure of social desirability, and was positively correlated with self-esteem. Total scores on the SAS showed a differential pattern of associations with demographic data, validity scales, self-report measures of previous trauma, and
previous disaster experiences. Findings suggest that adults’ reports of survival attitude on the SAS were generally higher for men than women. This is consistent with findings that men fair better in a disaster event than women (Sommer & Mosley, 1972). In fact, the literature on gender issues in disasters is robust, exploring concurrent issues of gender and socioeconomic status, gender and ethnicity/culture, and the impact of women’s social roles in their ability to respond to adverse events (see Enarson & Chakrabarti, 2009 and Enarson, & Meyreles, 2004).

In the present study, SAS scores did not significantly differ as a function of ethnicity, but there were significant differences as a function of religion with Christians having significantly higher scores than Atheist/agnostic individuals on the SAS. Research has already described a relationship between religion and spirituality and physical health/survival in healthy individuals, with a reduction in mortality in those who regularly attend church or other services (Powell, Shahabi, and Thoresen, 2003). In the disaster planning literature, religious narratives have been found to provide a framework for interpretation of, preparedness for, and response to disasters (McGeehan and Baker, 2017). Given that religion and spirituality contribute to differences found for other disaster processing and response behaviors, it is unsurprising that religion or spirituality may influence thoughts and behavior during an emergency event.

Variables related to previous trauma, such as participants’ reports of increased exposure to traumatic events or PTSD symptomology, had varying results in relationship to scores on survival attitude. There was no relationship between exposure to traumatic events and survival attitude, and a small negative correlation between PTSD scores and survival attitude. This may provide some evidence against the previously discussed inoculation effect, in which individuals who have been exposed to previous disasters show less symptomology in subsequent disasters than those who have not had previous exposure, as suggested by Norris and Murrell (1988) and
others. If this were true, it would be expected that individuals who have previous disaster experience might have learned how to manage these events and would score higher on the SAS.

Scores on measures of aspects of individuals that might be more open to change, such as healthy decision-making skills, ability to control anxiety, and optimism were significantly positively correlated with survival attitude scores. This is not surprising, given that decision making, emotional control, and positivity were three aspects of survival attitude described in the literature review. The MDMQ was used in the present study to assess four categories of decision making. Of those, three subscales, representing negative decision-making styles (buck-passing, procrastination, and hypervigilance) were negatively correlated with scores on the SAS. This suggests that individuals who score high on the SAS score are less likely to say that they engage in buck-passing, in which they force others to make the decision for them, less likely to say that they procrastinate, and less likely to report that they are hypervigilant in making decisions with a hurried, anxious approach. The positive subscale of decision-making on the MDMQ, Vigilance, was also positively correlated with SAS scores, suggesting that higher survival attitude scores are related to higher positive decision-making strategies.

Several authors (Sherwood, 2009; Siebert, 2007; Watson, 2005) describe decision making as being able to identify a threat and quickly being able to decide the best course of action to take in response to that threat. However, present study results using the MDMQ suggest specific types of decision making strategies that are related to survival attitude as measured by the SAS. Present findings suggest that additional research that focuses on the role of survival attitude in high stress decision making should be conducted. Much of the decision-making literature in disaster response focuses on agency decision making and coordinated decision making after an emergency (Smith & Dowell, 2000; Kapucu, & Garayev, 2011) However,
present study findings suggest the need to consider participants’ perceptions of decision-making skills as it relates to survival attitude during a crisis or emergency situation.

In existing disaster literature, emotional control was described as a global concept in which an individual can keep calm and control all emotion in order to manage the crisis situation more effectively (Sherwood, 2009; Stroud, 2011). Consistent with existing literature, the Anxiety Control Questionnaire specifically measured participants’ reports of their ability to control anxiety and was found to have a positive association with SAS scores. Optimism scores were also positively related to SAS scores in the present research. Optimism is similar to the concept of positivity discussed in emergency literature as helpful in avoiding unhealthy thought patterns and improving efficiency by decreasing stress (Henman, 2001; Nardini, 1952; Watson, 2005). The possibility of changing adults’ decision-making abilities, anxiety control, and/or optimism levels raises interesting questions about the ability of skills training to increase adults’ survival attitude. For example, if individuals received training on decision-making skills, would their scores on the SAS change?

In the present study, adults’ reports of previous experience with disasters also showed significant associations with survival attitude. Participants who had previous disaster experience as a volunteer responder, who were affected by a disaster as a victim, who had previous disaster response training, and who had careers in emergency response, generally had higher survival attitude scores. This might be expected because some of these individuals would likely be better prepared for a second survival situation after having been through one, no matter what their role was in the experience. Leach (2004), a disaster researcher, discussed cognitive limitations in a disaster as relatively easy to overcome with training. Training can assist an individual respond better to a disaster situation with practice, training, and experience. According to Leach (2004),
improvements occur by providing individuals with temporal and working memory capacity to create a temporary schema of actions, assemble those actions into the correct sequence, and combining those actions with one another. This is said to help reduce cognitive storage and processing demands (Leach, 2004).

The ability to train someone to respond to a disaster begs the question of which experiences increase survival attitude. Leach’s (2004) perspectives suggests that any disaster experience, in any capacity, increases survival attitude. It’s possible that having these experiences alone causes individuals to consider what they would do in a survival situation and helps them to feel more confident in their response for future disaster events. Again, if a future goal is to increase the level of survival attitude to potentially increase survival in high-stress situations, it may be key to understand these types of relationships and determine what it is about these experiences is valuable. Future research is also needed to determine what types of teaching techniques, if any, would be most useful in promoting survival attitude in adulthood.

**Survival Response Findings**

In the present study, a vignette of response strategies to an active shooter situation was developed based on the latest crisis intervention techniques and law enforcement practices to contain mass shootings (Federal Bureau of Investigation, n.d.). Results suggest gender and age differences in vignette scores with men typically scoring higher on the response strategies vignette than women and vignette scores generally increasing as a function of age. Findings also suggest that adults identifying as Christian generally had higher vignette scores than adults identifying as Atheist/Agnostics. Demographic differences in response strategies scores are similar to demographic differences found in participants’ responses to the SAS. Increases in scores on survival response strategies as a function of age may suggest that survival knowledge
increases over time. This increase in knowledge may be through general life experience or increased probability of exposure to crisis situations.

Interestingly, self-reported experience with past disasters generally did not have a relationship to scores on the survival response strategies vignette. Specifically, scores on the survival response strategies vignette did not significantly differ as a function of adults’ reports of being personally affected by a disaster, previous disaster response training, working as a first responder or in high stress jobs where there is a high level of interaction with traumatized individuals, and past military experience. Rather, vignette scores only differed as a function of adults’ self-reports of previous volunteer experience in a disaster. This is in contrast to findings on the SAS related to past disasters, which suggested that participants had higher survival attitude scores for every category of past disaster experience relative to participants who did not have these types of previous disaster experiences. Although authors suggest that increased disaster experience would result in better survival response strategies during an emergency (Leach, 2004), present findings do not support this claim. Present results appear to suggest that experience or training may improve survival attitude or confidence in one’s response, but may not improve one’s knowledge of response strategies in a specific emergency such as an active shooter situation.

Present findings indicate a significant positive correlation between survival attitude scores and scores on the response strategies vignette. There were modest negative correlations between the three MDMQ decision making measure subscales (buck-passing, procrastination, and hypervigilance) and survival response strategies scores but no significant relationship between the vigilance subscale and survival response strategies vignette scores. The decision-making literature suggests that stress leads to a failure to systematically consider all available
options in making a decision (Keinan, 1987). During severe stress, positive decision-making skills such as vigilance - characterized by a search for relevant information, assimilation of the information, and an unbiased appraisal before making a choice - are replaced by hypervigilance. Hypervigilance is characterized by hasty, disorganized, and incomplete evaluation of information when making a choice. Stress itself influences decision making by rushing a choice to be made before all options are considered, nonsystematic analysis of options, and insufficient time devoted to considering each alternative (Keinan, 1987). These results suggest that as individuals scored higher on the vignette, they were able to engage in fewer of these negative decision-making patterns. However, they may not have been able to engage in the more organized vigilante-type of decision making. This may also prove important for future research in survival response strategies and decision making.

There were low positive correlations between survival response strategies and measures of personality characteristics that included the Anxiety Control Questionnaire, The Life Orientation Test, and the Rosenberg Self-Esteem Scale. This pattern of correlations was similar to correlations between personality measures and the SAS. Present findings suggest that these personality characteristics might also play a role in response strategies in an active shooter situation and more research examining personality factors directly related to disaster response strategies is warranted.

Survival response strategies vignette scores were not significantly related to self-reported previous trauma as measured by the Life Events Checklist and the PTSD Checklist. This suggests that adults’ survival response strategies in a novel active shooter scenario were unrelated to their reports of multiple traumatic experiences or has symptoms PTSD. This finding
appears consistent with the military security clearance guidelines that allows clearance for
military duties for soldiers diagnosed with PTSD (Defense Security Service, n.d.).

**Predicting Survival Response from the SAS**

The utility of a measure of survival attitude lies in its ability to describe how individuals
will act during a real-life disaster. In the present study, the criterion validity of the Survival
Attitude Scale was examined by describing the relative contribution of scores on survival attitude
in accounting for variation in scores on a survival response strategies vignette of an active
shooter in a school situation. Hierarchical multiple regression techniques were used in the
present study to examine the relative contribution of scores on the SAS to account for variation
in vignette scores beyond that of demographic variables, previous disaster experience, and other
relevant factors such as perceived decision-making ability, previous trauma experience, and
personality factors. Since there was no a priori rationale for deciding on an order of importance
for decision-making, previous trauma experience, and personality factors in accounting for
variation in survival response strategies vignette, separate regression analyses were conducted to
examine the potential contribution of the SAS relative to these factors. This analytic procedure
provides a most conservative estimation of the ability of survival attitude scores in accounting
for variance in vignette scores. Scores on the SAS were hypothesized to statistically predict a
significant portion of the variance in survival scores after accounting for demographic
characteristics, previous trauma experience, and perceptions of decision-making ability, previous
trauma experience, and personality factors considered separately.

In terms of their predictive ability, age, gender and religious affiliation did account for a
significant proportion of the variance in survival response scores. Specifically, regression
findings are similar to individual level correlations to indicate that adults who are older, male,
and Christian generally score higher on the survival response strategies vignette. After accounting for variation due to demographic characteristics, participants’ reports of previous experience as volunteer/first responder was significantly predictive of survival response strategies vignette scores.

In the first regression analysis, the addition of scores on the decision-making ability measure, the MDMS, significantly predicted variation in survival response strategies survival response strategies vignette scores beyond that of demographics and previous trauma experience. Specifically, buck-passing and hypervigilance were negatively related to survival response strategies vignette scores and together accounted for an additional 8% of the variance in survival response strategies beyond that of demographics and previous trauma experience. The final level included the SAS, which significantly contributed accounting for variation in survival response strategies vignette scores with an additional 2% of the variance being accounted for by SAS scores. Thus, higher levels of survival attitude were significantly related to greater knowledge of response strategies in an active shooter situation, regardless of adults’ reports of demographics, previous responder experience, and perceived decision-making abilities.

This pattern of results is the same for the role of survival attitude in accounting for variation in survival response strategies vignette scores relative to self-reported aspects of personality. In the third regression analyses, perceived level of anxiety control, and not perceived optimism or self-esteem, significantly contributed to accounting for variance in survival response strategies vignette scores beyond that of demographics and previous responder experience. Here again, anxiety control scores accounted for about 8% of the variance in survival response strategies vignette scores beyond that of demographics and previous responder experience. The addition of SAS scores in the final step of the equation accounted for an
additional 5% of the variance in survival response strategies vignette scores. Here again, findings demonstrate the utility of the SAS in accounting for knowledge of survival response strategies in an active shooter situation, regardless of demographic factors and previous responder experience.

Adults’ reports of previous trauma experience, as measured by the Life Events Checklist and PTSD Checklist significantly predicted variance in survival response strategies vignette scores. Results indicate that survival attitude scores accounted for an additional 6% of the variance in survival response strategies vignette scores, beyond that of demographics, previous responder experience, and self-reports of previous trauma experience. In step 3 of the regression analysis, both the PTSD Checklist and the Life Events Checklist significantly contributed to the variance in survival response scores. PTSD checklist scores were negatively related to survival response scores, suggesting that lower PTSD scores was related to higher survival response. For the Life Events checklist, higher scores on the checklist were related to higher scores on survival response strategies. Previous trauma experiences and experience as a disaster volunteer accounted for the least amount of variance, 1% each.

Overall, results of regression analyses suggest the usefulness of assessing survival attitude in predicting knowledge of survival response as measured by a self-report measure of survival response strategies in an active shooter situation. In this most conservative test of predictive power of the SAS, scores on the survival attitude measure were able to account for between 2% and 6% of variation in survival response strategies vignette scores. Of course, present findings suggest significant but relatively modest amounts of variance in survival response strategies vignette scores by demographic characteristics, personality factors and survival attitude scores. At this juncture, the practical utility of these factors in predicting
survival response strategies in real life situations in unknown. However, unlike demographic characteristics, factors such as decision-making ability, anxiety control, and survival attitude are elements that may be improved with training. Although preliminary, present findings provide useful insights into relevant factors related to survival response strategies for future research.

**Survival Attitude and Resilience**

The present study also provided a unique opportunity to explore relationships between self-report measures of survival attitude and resilience as they relate to knowledge of survival response strategies in an active shooter situation. Findings indicated a high correlation between scores on survival attitude and resilience measures, and further inspection revealed a fair amount of overlap in item content between the two measures. To empirically explore relationships between the two measures with regard to survival response strategies, a set of three multiple regression analyses were conducted to investigate the contribution of resilience scores in accounting for variation in survival response strategies vignette scores. The goal of these analyses were to explore the predictive ability of the resilience measure in predicting survival response strategies vignette scores and compare that to the predictive ability of survival attitude in accounting for survival response strategies vignette scores, after accounting in both cases for demographic characteristics, previous responder experience and decision-making ability, previous trauma experience, and personality characteristics. Regressions exploring the predictive ability of the resilience measure were identical to those conducted with the SAS, with scores on the Connor – Davidson Resilience Scale being substituted in the regression equations for the SAS.

Overall, results of these analyses indicate that the SAS is consistently a better predictor of survival response strategies vignette scores than the Connor-Davidson Resilience Scale. In fact,
scores on the resilience measure did not significantly contribute to accounting for variation in survival response strategies vignette scores beyond that of perceived decision-making ability and personality variables. Interestingly, resilience scores did significantly contribute to the prediction of survival response strategies vignette scores above that of demographics, previous responder experience, and previous trauma experience, but survival attitude scores accounted for twice the additional variance in survival response strategies vignette scores than did resilience scores. However, these results do suggest that further research is needed to explore similarities and differences in the constructs of survival attitude and resilience. Research is also needed to better understand the possible role of resilience in survival response.

**Study Limitations**

Although present findings are intriguing, the present study is limited in a number of important respects. The research used a convenience sample of individuals from the online website Amazon MTurk. There has been some debate regarding the representativeness of MTurk samples in the research literature, with some studies suggesting that MTurk data is equivalent to other data collection methods (Huff & Tingley, 2015). Although the sample varied with respect to a variety of demographic characteristics such as gender, age, and religious backgrounds, the majority of study participants (78.3%) were Caucasian. Additionally, the relatively small sample size of first responders, and individuals in the military made comparisons about the experiences of these groups difficult. Further research is needed with diverse samples of individuals to determine the generalizability of present findings. Future research could also use a more targeted approach to data collection that could result in an increased sample of individuals such as collecting data from military veterans from Veterans Administration hospitals.
Another limitation of the present research is related to the self-report nature of data. There is typically a tradeoff between the ease of data collection that comes with self-report studies and the more difficult, but likely more face valid, real-time simulations of disasters. The use of vignettes in social science literature has a long history and has been supported by the literature as an effective way to standardize a social stimulus across respondents while making the decision-making situation more real (Alexander and Becker, 1978). However, online administration of vignettes cannot give participants a realistic simulation of a crisis emergency situation. In addition, the vignette used in this study presents a novel, active shooter situation with which participants are likely to have had little previous experience. The measure was not validated on previous samples. In the present study, the degree to which the use of a vignette that was developed for the research and not previously validated impacts the generalizability of research findings is unclear.

Given the lack of psychology research on factors that impact survival during a disaster, the present research is contextualized using existing sources from a variety of literatures. This makes comparing present results with existing empirical research studies difficult. Clearly, more research is needed in psychology to investigate this important, and unfortunately, timely topic of factors related to surviving a crisis such as an active shooter situation. The present research is seen as a critical first step on this important topic.

**Directions for Future Research**

Despite its limitations, present study findings suggest several avenues for future research on survival attitude and survival response strategies during a crisis situation. The present study highlights the lack of empirical research in psychology and other disciplines devoted to understanding factors related to survival during a crisis emergency. Given the dramatic increase
in mass shootings and other types of terrorist attacks in the United States and around the world (Federal Bureau of Investigation [FBI], Active Shooter Incidents), psychology has an important role to play in conducting rigorous and meaningful research on this topic. Continued study of survival response strategies is critically needed to describe factors likely to increase the odds of survival in an emergency situation and to help create a body of psychology literature related to disaster survival. The development of an empirical literature on survival in psychology has important implications for both disaster preparedness, training, and for social policy (Leach, 1994, Dynes, 1994).

Present findings suggest specific factors that might be important in research on survival response strategies. Decision making is one area of future research suggested by the present study findings. Studies of both perceived decision-making abilities and actual decision-making strategies could be investigated in relationship to knowledge of survival response strategies. For example, in the area of training, researchers consider pre-post research designs to measure the amount of change in survival response strategies before and after learning specific decision-making skills. Similarly, present findings suggest that anxiety control might also be a factor relevant to knowledge of survival response strategies. Existing research on anxiety control (Lang and McNiel, 2006) may be helpful in directing future research that focuses on anxiety issues during a crisis emergency. In addition, future research can investigate other types of emotional control variables such as panic and frustration that could also contribute to increased survival response strategies.

Although preliminary, present findings suggest the utility of survival attitude in understanding knowledge of survival response strategies in an active shooter situation. Future research is needed that focuses on refining elements of survival attitude, assessing contextual
factors related to the effectiveness of survival attitude during crisis situations, and relationships between survival attitude and other psychological constructs. Basic questions such as “is survival attitude changeable?” and “what sorts of events have the greatest impact on survival attitude?” have yet to be empirically studied. Additionally, understanding individual demographic factors related to survival attitude and survival response can have direct implications for training citizens, first responders, and military personnel in survival response during a crisis emergency. Of course, measurement studies are needed in order to develop meaningful, well validated assessment tools in this area. The present study provides a compelling first step toward understanding the concept of survival attitude. Given the increased occurrence of active shooter situations in the United States, the psychology of survival is a critical area for future research.
REFERENCES


Center for Personal Protection and Safety (2016). Product Information. Retrieved from:  
http://www.cppss.com/products

American Psychological Association.


Greenberg, S. F. (2007a). Active shooters on college campuses: Conflicting advice, roles of the individual and first responder, and the need to maintain perspective. *Disaster medicine and public health preparedness, 1*(S1), S57-S61.


of traumatic stress, 9(1), 3-23.


Behaviour in Fire (pp. 386-397).


Research in school shootings. Sociology Compass, 1(1), 60-80.

New Poll Reveals Only Seven Percent of Americans Are 'Red Cross Ready' for a Disaster or Emergency. (June 12 2007). retrieved 02/19/2017, from Government Technology Web Site: http://www.govtech.com/health/New-Poll-Reveals-Only-Seven-Percent.html


Religious struggle as a predictor of mortality among medically ill elderly patients: a 2-year longitudinal study. Archives of Internal Medicine, 161(15), 1881-1885.

Assessment and prediction of stress-related growth. Journal of personality, 64(1), 71-105.

Reputation as a sufficient condition for data quality on Amazon Mechanical Turk. Behavior research methods, 46(4), 1023-1031.


Inside the Turk: Understanding Mechanical Turk as a participant pool. Current Directions in Psychological Science, 23(3), 184-188.


Books.


Sherwood, B. (2009). The survivors club: The secrets and science that could save your


Torrance, E.P. (1954). The behavior of small groups under the stress conditions of “survival.”


APPENDIX A: TABLES

Table 1
*Participant Demographic Data*

<table>
<thead>
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<th>Variable</th>
<th>$n$</th>
<th>%</th>
<th>Variable</th>
<th>$n$</th>
<th>%</th>
</tr>
</thead>
<tbody>
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<td></td>
<td></td>
<td>Marital Status</td>
<td></td>
<td></td>
</tr>
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<td>Male</td>
<td>164</td>
<td>40.90</td>
<td>Never Married</td>
<td>161</td>
<td>40.15</td>
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<td></td>
</tr>
<tr>
<td>Ethnicity</td>
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<td></td>
<td>Religious Affiliation / Beliefs</td>
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<td>Christian</td>
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<td>Jewish</td>
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<td>2.00</td>
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<td>No Affiliation</td>
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<td>Other</td>
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<td>0.75</td>
<td>Other</td>
<td>15</td>
<td>3.74</td>
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*Note. $N = 401$*

*Note. The mean participant age was 37.28 ($SD = 11.51$).*
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<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Example Item</th>
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</thead>
<tbody>
<tr>
<td>Threat Assessment and Decision Making</td>
<td>Individuals are able to quickly and accurately assess the situation and determine their own level of danger. They observe the environment to develop a realistic view of the situation as it occurs, anticipate potential threats, and make logical decisions based on their previous knowledge and experience. They use common sense to understand the situation and consider a number of creative alternative responses before making a choice about how to respond.</td>
<td>“I would be pretty good at figuring out if things are getting out of control or dangerous.”</td>
</tr>
<tr>
<td>Taking Control</td>
<td>Individuals take an active response to an emergency situation, such as analyzing the situation, considering options, quickly choosing an appropriate action, and carrying it out decisively. Rather than act impulsively, individuals who take control consider the most effective moment for action and can hold back when necessary.</td>
<td>“I would make quick, good decisions under pressure.”</td>
</tr>
<tr>
<td>Emotional Control</td>
<td>Individuals stay calm and composed despite hectic or stressful circumstances. This improves individuals’ awareness, ability to remain rational, and focus, which helps them choose more effective actions in an emergency.</td>
<td>“I would be able to think calmly and rationally even when people around me were emotional.”</td>
</tr>
<tr>
<td>Self-preservation</td>
<td>Individuals are determined to survive and persist in finding ways to defend themselves in a life threatening situation. Individuals who score highly on this subcategory value their life and their continued survival, and prioritize their responses based on that survival goal, even if that means behaving in ways that might be seen as cold or ruthless.</td>
<td>“I would be willing to do whatever it takes to make sure that I don’t get hurt.”</td>
</tr>
<tr>
<td>Positivity</td>
<td>Individuals have the ability to be positive, optimistic, and hopeful despite negative circumstances. These individuals actively avoid unhelpful thought patterns that don’t work to solve problems. They improve efficiency by decreasing stress with humor or by relying on their faith, which is a source of strength for them. They have confidence in their ability to handle difficult challenges.</td>
<td>“I would be pretty optimistic in my ability to handle the situation.”</td>
</tr>
</tbody>
</table>
Table 3  
*Descriptive Statistics for Main Study Measures*

<table>
<thead>
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<th>Measure</th>
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<th>SD</th>
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<td>Survival Attitude Scale</td>
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<td>Survival Vignette</td>
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<tr>
<td>MDMQ Subscales</td>
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<td></td>
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<tr>
<td>Vigilance</td>
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<td>Buck-passing</td>
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<tr>
<td>Procrastination</td>
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<tr>
<td>Hypervigilance</td>
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<tr>
<td>Life Orientation Test</td>
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<tr>
<td>Rosenberg Self-Esteem Scale</td>
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<td>6.53</td>
</tr>
<tr>
<td>MC Social Desirability Scale</td>
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<td>2.35</td>
</tr>
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<td>Life Events Checklist</td>
<td>42.77</td>
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<tr>
<td>PTSD Checklist</td>
<td>16.38</td>
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<tr>
<td>Resilience Scale</td>
<td>69.12</td>
<td>16.10</td>
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*Note. N = 401*
Table 4

Results of t-tests for Main Study Measures by Gender

<table>
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<tr>
<th>Measure</th>
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<th>Female</th>
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<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
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<tr>
<td>Survival Attitude Scale</td>
<td>4.28</td>
<td>.62</td>
<td>4.10</td>
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<tr>
<td>Survival Vignette</td>
<td>5.21</td>
<td>1.06</td>
<td>4.86</td>
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<tr>
<td>MDMQ Subscales</td>
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<tr>
<td>Vigilance</td>
<td>10.04</td>
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<td>Buck-passing</td>
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<td>Procrastination</td>
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<td>PTSD Checklist</td>
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Note. df = 397
* p < .05, ** p < .001
### Results of t-tests for Main Study Measures by Disaster Volunteer Experience

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<td>$SD$</td>
<td>Yes</td>
<td>$M$</td>
<td>$SD$</td>
<td>$T$</td>
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<td>Survival Attitude Scale</td>
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<td>4.44</td>
<td>.56</td>
<td>-4.33**</td>
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<td>Factor 1: Effective</td>
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<td>12.74</td>
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<td>-4.38**</td>
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<td>Factor 2: Control</td>
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<td>Factor 3: Self-preservation</td>
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<tr>
<td>Survival Vignette</td>
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*Note. df = 399*

* $p < .05$, ** $p < .001$
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<th>Factor 1: Effective ( \alpha = .93 )</th>
<th>Factor 2: Control ( \alpha = .13 )</th>
<th>Factor 3: Self-preservation ( \alpha = .17 )</th>
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<td>I would respond quickly and effectively.</td>
<td>86</td>
<td>I would think about how others would deal with this situation and do the same.</td>
<td>77</td>
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<tr>
<td>I would make quick, good decisions under pressure.</td>
<td>86</td>
<td>I would use my faith to give me a sense of hope and purpose in dealing with the unexpected.</td>
<td>56</td>
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<tr>
<td>I would be pretty optimistic in my ability to handle the situation.</td>
<td>81</td>
<td>I would be willing to do whatever it takes to make sure that I don’t get hurt.</td>
<td>74</td>
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<tr>
<td>I would be able to think calmly and rationally even if there were people around me who were emotional.</td>
<td>81</td>
<td>If other people were involved, I would be altruistic and selfless even at my own expense.</td>
<td>57</td>
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<tr>
<td>I would take control of the situation.</td>
<td>79</td>
<td>I would try things that other people would not think about doing.</td>
<td>67</td>
</tr>
<tr>
<td>I would analyze what is going on and come up with options.</td>
<td>79</td>
<td>With a lot going on at once, I would be pretty good at determining which events are most important to my own safety.</td>
<td>76</td>
</tr>
<tr>
<td>I would have trouble thinking clearly.</td>
<td>77</td>
<td>I would be pretty good at figuring out if things are getting out of control or dangerous.</td>
<td>74</td>
</tr>
<tr>
<td>I would analyze what is going on and come up with options.</td>
<td>79</td>
<td>I would try things that other people would not think about doing.</td>
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<tr>
<td>I would have trouble thinking clearly.</td>
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<tr>
<td>I would try things that other people would not think about doing.</td>
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<td>With a lot going on at once, I would be pretty good at determining which events are most important to my own safety.</td>
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Table 7
Survival Attitude and Connor-Davidson Resilience Scales: Item Comparison

<table>
<thead>
<tr>
<th>SAS Items (Factor 1: Effective)</th>
<th>Matching Resilience Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I would make quick, good decisions under pressure.</td>
<td>24. I usually find it hard to deal with difficult problems. (R)</td>
</tr>
<tr>
<td>2. I would respond quickly and effectively.</td>
<td>No matching items.</td>
</tr>
<tr>
<td>3. I would take control of the situation.</td>
<td>5. When I am frightened by something, there is generally nothing I can do.</td>
</tr>
<tr>
<td></td>
<td>8. Whether I can successfully escape a frightening situation is always a matter of chance with me. (R)</td>
</tr>
<tr>
<td></td>
<td>12. I can usually influence the degree to which a situation is potentially threatening to me.</td>
</tr>
<tr>
<td></td>
<td>14. There is little I can do to change frightening events. (R)</td>
</tr>
<tr>
<td></td>
<td>15. The extent to which a difficult situation resolves itself has nothing to do with my actions. (R)</td>
</tr>
<tr>
<td></td>
<td>16. If something is going to hurt me, it will happen no matter what I do. (R)</td>
</tr>
<tr>
<td></td>
<td>20. Most events that make me anxious are outside my control. (R)</td>
</tr>
<tr>
<td>5. I would analyze what is going on and come up with options.</td>
<td>No matching items.</td>
</tr>
<tr>
<td>6. I would have trouble thinking clearly.</td>
<td>10. I can usually put worrisome thoughts out of my mind easily.</td>
</tr>
<tr>
<td>8. I would be pretty good at figuring out if things are getting out of control or dangerous.</td>
<td>1. I am usually able to avoid threat quite easily.</td>
</tr>
<tr>
<td>9. I would try things that other people wouldn’t have thought about doing.</td>
<td>No matching items.</td>
</tr>
<tr>
<td>12. I would be able to think calmly and rationally even when people around me were emotional.</td>
<td>3. When I am put under stress, I am likely to lose control. (R)</td>
</tr>
<tr>
<td></td>
<td>4. I can usually stop my anxiety from showing.</td>
</tr>
<tr>
<td></td>
<td>6. My emotions seem to have a life of their own. (R)</td>
</tr>
<tr>
<td></td>
<td>9. I often shake uncontrollably. (R)</td>
</tr>
</tbody>
</table>
19. I would be pretty good at determining which events in are most important to my own safety.

23. I would be pretty optimistic in my ability to handle the situation.

13. I am able to control my level of anxiety.

22. I am unconcerned if I become anxious in a difficult situation, because I am confident in my ability to cope with my symptoms.

26. When I am anxious, I find it hard to focus on anything other than my anxiety. (R)

No matching items.

18. When I am under stress, I am not always sure how I will react. (R)

21. I always know exactly how I will react to difficult situations.

---

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Item 12 Continued</td>
<td>Item 12 Continued</td>
</tr>
<tr>
<td>Item 13</td>
<td>I am able to control my level of anxiety.</td>
</tr>
<tr>
<td>Item 22</td>
<td>I am unconcerned if I become anxious in a difficult situation, because I am confident in my ability to cope with my symptoms.</td>
</tr>
<tr>
<td>Item 26</td>
<td>When I am anxious, I find it hard to focus on anything other than my anxiety. (R)</td>
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<table>
<thead>
<tr>
<th>SAS Items (Factor 2: Give Up Control)</th>
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<td>Item 7</td>
<td>I would think about how others would deal with unexpected and do the same.</td>
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<tr>
<td>Item 22</td>
<td>I would use my faith to give me a sense of hope and purpose in dealing with the unexpected.</td>
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<tr>
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<td>No matching items.</td>
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<table>
<thead>
<tr>
<th>SAS Items (Factor 3: Self-preservation)</th>
<th>Matching Resilience Items</th>
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<tr>
<td>Item 16</td>
<td>I would be willing to do whatever it takes to make sure that I don’t get hurt.</td>
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<tr>
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<td>No matching items.</td>
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<tr>
<td>Item 17</td>
<td>I would be altruistic and selfless even at my own expense. (R)</td>
</tr>
<tr>
<td></td>
<td>No matching items.</td>
</tr>
<tr>
<td>Item 20</td>
<td>I would use humor as a way to reduce tension. (R)</td>
</tr>
<tr>
<td></td>
<td>No matching items.</td>
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<table>
<thead>
<tr>
<th>Remaining Resilience Scale Items</th>
<th>Description</th>
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<tbody>
<tr>
<td>No matching items.</td>
<td>2. How well I cope with difficult situations depends on whether I have outside help. (R)</td>
</tr>
<tr>
<td></td>
<td>7. There is little I can do to influence people's judgments of me. (R)</td>
</tr>
<tr>
<td></td>
<td>11. When I am in a stressful situation, I am able to stop myself from breathing too hard.</td>
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</tbody>
</table>
17. I can usually relax when I want.
19. I can usually make sure people like me if I work at it.
23. What people think of me is largely outside of my control. (R)
25. When I hear someone has a serious illness, I worry that I am next. (R)
27. I am able to cope as effectively with unexpected anxiety as I am with anxiety that I expect to occur.
28. I sometimes think, "Why even bother to try coping with my anxiety when nothing I do seems to affect how frequently or intensely I experience it?" (R)
29. I often have the ability to get along with "difficult" people.
30. I will avoid conflict due to my inability to successfully resolve it. (R)

Note. SAS Items 4, 10, 11, 13, 14, 15, 18, and 21 were removed following exploratory factor analysis.
Note. (R) indicates that an item was reverse scored.
### Table 8

**Intercorrelation Matrix**

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*Note. N = 401*

* p < .05, ** p < .01
Table 9
Hierarchical Regression Analysis Predicting Survival Response Strategy Vignette Scores:
Demographic variables, previous disaster experience, decision making, and survival attitude

<table>
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<th>Variable</th>
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<th>Step 3</th>
<th>Step 4</th>
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<th>$\Delta R^2$</th>
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* $p < .05$, ** $p < .001$
Table 10
Hierarchical Regression Analysis Predicting Survival Response Strategy Vignette Scores: Demographic variables, previous disaster experience, previous trauma, and survival attitude

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* $p < .05$, ** $p < .001$
Table 11
Hierarchical Regression Analysis Predicting Survival Response Strategy Vignette Scores:
Demographic variables, previous disaster experience, personality variables, and survival attitude

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* p < .05, ** p < .001
Hierarchical Regression Analysis Predicting Survival Response Strategy Vignette Scores: Demographic variables, previous disaster experience, decision making, and resilience

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Table 13
Hierarchical Regression Analysis Predicting Survival Response Strategy Vignette Scores:
Demographic variables, previous disaster experience, previous trauma, and resilience

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*\( p < .05 \), **\( p < .001 \)
APPENDIX B: RECRUITMENT SCRIPT FOR PARTICIPANTS

Subject: $1.00 Credit for 40-60 Minute Online Survey

Hello, my name is Wendy Fogo. I am a graduate student in Clinical Psychology. I am currently working on a research project that involves understanding individuals’ reactions in emergency situations. More specifically, I am interested in the relationship between how people think in everyday life and how they will respond during an emergency.

You are invited to participate in this research study. Participation in this study involves completing an online questionnaire at a computer of your choice. I estimate that it will take you approximately 40-60 minutes to complete this survey. The anticipated risks to you as a result of participation in this study are no greater than those normally encountered in daily life. For your participation in this study, you will receive $1.00.

If you have questions or comments about this research, you may contact the primary investigator at wrfogo@gmail.com. Please do not hit Reply to respond to this email.

Thank you for your time!

Sincerely,
Wendy Fogo
Hello, my name is Wendy Fogo and I am a doctoral student in Clinical Psychology at Bowling Green State University. I am interested in understanding how people think they would react during a crisis situation. The results of this study can increase our understanding how individuals can learn to react to crisis events in ways that are adaptive.

You must be between 18 and 65 years of age to take part in the study. Participation involves completing an online questionnaire at a computer of your convenience. The estimated time that it should take you to complete this survey is about 45–50 minutes or less. The anticipated risks to you as a result of participation in this study are no greater than those normally encountered in daily life. As a participant recruited through MTurk, you will have $0.50 credited to your account if you meet the inclusion criteria and provide quality answers. Further, this research may be beneficial to you by giving you an opportunity to consider the way in which you might respond in a crisis situation.

The information you provide during this study will be kept confidential; only those directly involved in data collection or analysis have access to the data that will be collected. Identifying information will be stored in a database separate from your responses on the survey. All data will be removed from the server within one year and will subsequently be erased from the server. All identifying information will be destroyed once credit has been awarded to participants.

Since the internet is not 100% secure in regard to privacy, please remember to not leave the partially completed survey open or unattended if completing it on a public computer, and to clear the browser page history and cache when finished with the survey.

Your participation in this study is completely voluntary. You are free to withdraw consent and to discontinue participation in the study at any time without penalty or explanation. Your decision to participate in this study or not will have no impact on your future research participation or your relationship with MTurk in any way. If you have any questions or comments about this study, you can contact Wendy Fogo at wrfogo@gmail.com or Catherine Stein, PhD, the project advisor at (419) 372-2301. If you have further questions or concerns regarding the conduct of the study or your rights as a research participant, you may contact the Chair of the Institutional Review Board at Bowling Green State University at (419) 372-7716 or at orc@bgsu.edu.

Please click on one of the following buttons to indicate if you wish to participate in this study:

- I have read all of the above information and I am consenting to participate in this study.
- I do not want to participate in this study.
Participant Demographics

1. Age ____

2. Gender
   - ☐ Female
   - ☐ Male
   - ☐ Transgender
   - ☐ Other -- Please specify _______________

3. Ethnicity
   - ☐ African American
   - ☐ Caucasian
   - ☐ Hispanic
   - ☐ Asian
   - ☐ Pacific Islander
   - ☐ American Indian
   - ☐ African
   - ☐ Middle Eastern
   - ☐ Biracial
   - ☐ Other - Please Specify _______________

4. Religious affiliation/beliefs
   - ☐ Protestant
   - ☐ Methodist
   - ☐ Spiritual (do not attend services)
   - ☐ Other
   - ☐ Catholic
   - ☐ Christian
   - ☐ Atheist/Agnostic
   - ☐ Jewish
   - ☐ No affiliation

5. Marital status
   - ☐ Married
   - ☐ Single, never married
   - ☐ Separated, divorced, widowed
6. States you have lived in: (note if you did not live in the US)

☐ Alabama ☐ Indiana ☐ Nebraska ☐ South Carolina
☐ Alaska ☐ Iowa ☐ Nevada ☐ South Dakota
☐ Arizona ☐ Kansas ☐ New Hampshire ☐ Tennessee
☐ Arkansas ☐ Kentucky ☐ New Jersey ☐ Texas
☐ California ☐ Louisiana ☐ New Mexico ☐ Utah
☐ Colorado ☐ Maine ☐ New York ☐ Vermont
☐ Connecticut ☐ Maryland ☐ North Carolina ☐ Virginia
☐ Delaware ☐ Massachusetts ☐ North Dakota ☐ Washington
☐ Florida ☐ Michigan ☐ Ohio ☐ West Virginia
☐ Georgia ☐ Minnesota ☐ Oklahoma ☐ Wisconsin
☐ Hawaii ☐ Mississippi ☐ Oregon ☐ Wyoming
☐ Idaho ☐ Missouri ☐ Pennsylvania ☐ Other: __________
☐ Illinois ☐ Montana ☐ Rhode Island

7. Please mark the item below that best describes the field in which you are currently employed:

☐ Student ☐ Insurance
☐ Advertising & Marketing ☐ Manufacturing
☐ Agriculture ☐ Medical
☐ Airlines & Aerospace ☐ Mental Health
☐ Automotive ☐ Military
☐ Business Support & Logistics ☐ Nonprofit
☐ Construction, Machinery, and Homes ☐ Police
☐ Education ☐ Retail & Consumer Durables
☐ Entertainment & Leisure ☐ Real Estate
☐ Emergency Medical Technician (EMT) ☐ Telecomm, Technology, Internet & Electronics
☐ Finance & Financial Services ☐ Transportation & Delivery
☐ Food & Beverages ☐ Utilities, Energy, and Extraction
☐ Government ☐ I am currently not employed
☐ Healthcare & Pharmaceuticals ☐ Other:
Participant Experience

Please rate your involvement in the following activities:

8. Have you been involved in an emergency or disaster situation in the past as a volunteer or responder?  
   Yes  No

9. Have you been involved in an emergency or disaster situation in the past as a person affected by the emergency or disaster?  
   Yes  No

10. Not including basic CPR and First Aid, do you have training through an organization that was for the purpose of providing assistance during emergency situations?  
    Yes  No

11. Are you or have you been in the military?  
    Yes  No

11b. If yes, were you ever deployed to a war zone during your service?  
    Yes  No

11c. If yes, during your deployment, were you engaged in combat during your service?  
    Yes  No

11d. If yes, during your deployment, were you engaged in other hazardous duties of a life threatening kind, other than combat?  
    Yes  No

12. Are you or have you been a police officer, firefighter, or EMT?  

13. Are you or have you been a medical professional?  
    Yes  No

13b. If so, have you been involved in the treatment of individuals who sustained traumatic injuries?  
    Yes  No

14. Have you worked in mental health services with the victims of trauma?  
    Yes  No

15. Have you had disaster/emergency experience in some other way? If yes, please explain:_________________________________  
    Yes  No

16. Although it is difficult to know exactly how any person would respond in an emergency situation, please consider how you think you might respond in an emergency. How confident are you that you would know what to do in an emergency situation if one happened tomorrow?  
    a. Extremely confident  
    b. Very confident  
    c. Somewhat confident  
    d. Not very confident
APPENDIX E: SURVIVAL ATTITUDE SCALE (SAS)

Instructions: Sometimes people find themselves in unexpected situations that could become dangerous. Unexpected situations may be things like finding yourself in an unsafe neighborhood, getting caught in a violent storm, or dealing with a person who is angry or threatening. We are interested in how you think you would approach unexpected situations. Please read each statement below and rate how well each statement describes you [on the following scale].

Strongly disagree (1)
Disagree (2)
Somewhat disagree (3)
Somewhat agree (4)
Agree (5)
Strongly agree (6)

In a life threatening emergency situation...

1. I would make quick, good decisions under pressure. TC
2. I would respond quickly and effectively. TC
3. I would take control of the situation. TC
4. I would take a long time to think through what to do. TC
5. I would analyze what is going on and come up with options. TA/DM
6. I would have trouble thinking clearly. TA/DM*
7. I would think about how others would deal with unexpected and do the same. TA/DM
8. I would be pretty good at figuring out if things are getting out of control or dangerous. TA/DM
9. I would try things that other people wouldn’t have thought about doing. TA/DM
10. I would not be very good at assessing the seriousness of the situation. TA/DM*
11. I would not be very good at controlling my emotions. EC*
12. I would be able to think calmly and rationally even when people around me were emotional. EC
13. I would manage my emotions and stay focused on what I need to do. EC
14. I would channel my emotions to help me respond in productive ways. EC
15. I would react to the emotions of others and get overly emotional myself. EC*
16. I would be willing to do whatever it takes to make sure that I don’t get hurt. SP
17. I would be altruistic and selfless even at my own expense. SP*
18. I would be a fighter and would have the will to survive, even in the most difficult circumstances. SP
19. I would be pretty good at determining which events in are most important to my own safety. SP
20. I would use humor as a way to reduce tension. P
21. I would have confidence in my ability to learn and change as events unfolded in unexpected situations. P
22. I would use my faith to give me a sense of hope and purpose in dealing with the unexpected. P
23. I would be pretty optimistic in my ability to handle the situation. P

Subscales:
TC: Taking Control
TA/DM: Threat Assessment and Decision Making
EC: Emotional Control
SP: Self-preservation
P: Positivity

* = Reverse scored item
APPENDIX F: SURVIVAL RESPONSE STRATEGY VIGNETTE

Directions: The paragraphs below describe a situation that could occur in a regular classroom on a university campus. Please read the paragraphs, imagining that this is one of your classrooms and that you are in the situation as it occurs. Think about how you might react in the situation based on the information that you are given in each of the paragraphs.

Paragraph 1

Imagine that you have just arrived to the classroom and you are sitting in a seat waiting for the class to start. After taking your notebook and pen out and putting them on the desk, you start gazing out of one of the four windows along the left side of this second floor classroom. The windows are opposite to the classroom door. Other students are walking in and finding their seats, and some are already seated. The instructor is at the front of the class, preparing to teach, and then shuts the classroom door to begin her lecture. A few minutes pass when you hear popping noises outside the classroom.

Based on what you just read, pick the response below that best describes you in this situation:

a. I would probably pay little or no attention to the noises, and continue to concentrate on the lecture.

b. I would probably wonder what the noises were, but would continue to concentrate on the lecture.

c. I would probably look around the room and see if anyone else looked like they heard the noises.

d. I would probably wonder what the noises were and be annoyed that students were messing around in the hallway while my class was in session.

e. I would probably be listening to the noises to determine what they could be, and thinking about what I should do.

Answer: We are looking for them to say that they would be attend to the noises (rather than ignore them) and try to get more information about what the noises could be.

A. \textit{SCORE} = 0, no awareness, no action – Passive
B. \textit{SCORE} = 0, some awareness, no action - Passive
C. \textit{SCORE} = 0 not taking personal responsibility - Passive
D. \textit{SCORE} = 0, awareness, misattribution - Active
E. \textit{SCORE} = 1, awareness, planning action – Active
Paragraph 2

This vignette begins where the last one left off.

Imagine that no one has made any effort to discover what the noises might be. A few other students around you make comments about the popping noises under their breath, while others seem to be unaware. After initially ignoring the noises, the professor now seems distracted by the intermittent popping sounds.

Based on what you just read, pick the response below that best describes you in this situation:

a. I would probably look to other students to decide if I should be concerned about the noises.

b. I would probably raise my hand and ask the instructor to investigate the noises.

c. I would probably get up from my seat and look out of the door window myself to investigate the noises.

d. I would probably call 911 on my cell phone and report that there was an emergency.

e. I would probably text a friend and ask if he/she has heard anything about what the noises are.

Answer: We want them to now attend to the noise and begin thinking about what they could be and how they might respond – they should be aware and making plans in their minds.

A. SCORE = 0, not taking personal responsibility, no action – Passive
B. SCORE = 1, taking responsibility, asking for assistance – Active
C. SCORE = 1, taking responsibility, active response – Active
D. SCORE = 1, taking responsibility, active response – Active
E. SCORE = 1, taking responsibility, active response – Active
Paragraph 3

This vignette begins where the last one left off.

Imagine that the student sitting next to you raised his hand and asked the instructor “What is that noise?” The instructor stops lecturing. The class is silent and students carefully listen for the noises together. After a minute or two, the instructor goes to the classroom door and looks out the window of the door. When she returns she says, “I think there is a man in the hallway wearing a mask and he has a gun.”

Based on what you just read, pick the response below that best describes you in this situation:

a. I would probably wait to see if the person in the hallway comes into my classroom.
b. I would probably do whatever I am told to do by the instructor or another classmate.
c. I would probably go to the window to see if it opened and if I could escape through the window.
d. I would probably look for a way to lock or barricade the door so the person could not gain entry into the classroom.
e. I would probably tell everyone to be quiet and shut the lights off in the room.

Answer: This is where we want them doing something active to prevent the situation – according to the DHS active shooter recommendations, the first response should be RUN. We don’t want them waiting to see what is happening or looking for themselves.

A. SCORE = 0, no planning, no action – Passive
B. SCORE = 0, no planning, no action – Passive
C. SCORE = 2, planning and action – Active & Correct for DHS recommendations
D. SCORE = 1, planning and action – Active - Incorrect for DHS recommendations
E. SCORE = 1, planning and action – Active - Incorrect for DHS recommendations
Paragraph 4

This vignette begins where the previous one ended.

Imagine that you have not moved yet. Several students have tried to open the windows but they do not open. There is no lock on the classroom door, but professor and a student have used a desk to barricade the door so no one can come in. The gunman is at the door of the classroom, trying the handle to open the door, and pushing against the door.

Based on what you just read, pick the response below that best describes you in this situation:

a. I would probably find a place to hide.
b. I would probably think “There is nothing I can do in this situation because I am trapped.”
c. I would probably do whatever other students were doing.
d. I would probably grab something heavy to throw at the intruder in case he comes in.
e. I would probably help hold the door closed.

Answer: This one should be designed as a HIDE situation, and I tried to tweak it to get it there. We want the next one to be the one where we want them to decide to fight back.

A. SCORE = 2, planning and action – Active and Correct for DHS recommendations
B. SCORE = 0, no planning, no action – Passive
C. SCORE = 0, no planning, no action – Passive
D. SCORE = 1, planning and action – Active
E. SCORE = 1, planning and action – Active
Paragraph 5

This vignette begins where the previous one ended.

Imagine that you are still in your seat at your desk. The gunman is trying to get in the door, and manages to push through the barricade. He enters your classroom and points his gun in the direction of students.

Based on what you just read, pick the response below that best describes you in this situation:

a. I would probably start screaming and crying.
b. I would probably text my family to tell them that I love them.
c. I would probably play dead and hope that the intruder doesn’t see me.
d. I would probably grab something heavy and throw it at the intruder.
e. I would probably try to break the window open to try to escape.

Answer: This is an immediate life threatening situation and because there is no other option, this is a situation in which the student should FIGHT back.

A. \( SCORE = 0, \) no planning, no action – Passive
B. \( SCORE = 0, \) no planning, no action – Passive
C. \( SCORE = 1, \) planning action – Active
D. \( SCORE = 2, \) planning and action – Active and Correct for DHS recommendations
E. \( SCORE = 1, \) planning action – Active

Paragraph 6

The vignette begins where the previous one ended.

The gunman has entered the classroom and pointed his gun at students. Students are now reacting by taking a variety of actions. Some students are hiding under their desks and some students are screaming. Other students are calling 911 on their cell phones. Some are yelling at and throwing things at the gunman. Outside, you can hear sirens and you can tell that the police have arrived and are on their way into the building. The gunman hears the police have arrived and runs out of the classroom and back down the hallway. Within a few minutes, you are notified by the police that the gunman has been apprehended and that it is safe to exit the building.
APPENDIX G: MELBOURNE DECISION MAKING QUESTIONNAIRE (MDMQ)

SCORING:
True for me (score 2)
Sometimes true (score 1)
Not true for me (score 0)

Vigilance Subscale
1. I like to consider all of the alternatives.
2. I try to find out the disadvantages of all alternatives.
3. I consider how to best carry out a decision.
4. When making decisions I like to collect a lot of information.
5. I try to be clear about my objectives before choosing.
6. I take a lot of care before choosing.

Buck-passing Subscale
7. I avoid making decisions.
8. I do not make decisions unless I really have to.
9. I prefer to leave decisions to others.
10. I do not like to take responsibility for making decisions.
11. If a decision can be made by me or another person I let the other person make it.
12. I prefer that people who are better informed decide for me.

Procrastination Subscale
13. I waste a lot of time on trivial matters before getting to the final decision.
14. Even after I have made a decision I delay acting upon it.
15. When I have to make a decision I wait a long time before starting to think about it.
16. I delay making decisions until it is too late.
17. I put off making decisions.

Hypervigilance Subscale
18. Whenever I face a difficult decision I feel pessimistic about finding a good solution.
19. I feel as if I am under tremendous time pressure when making decisions.
20. The possibility that some small thing might go wrong causes me to swing abruptly in my preference.
21. I cannot think straight if I have to make a decision in a hurry.
22. After a decision is made I spend a lot of time convincing myself it was correct.
APPENDIX H: ANXIETY CONTROL QUESTIONNAIRE (ACQ)

Listed below are a number of statements describing a set of beliefs. Please read each statement carefully and, on the 0-5 scale below, indicate how much you think each statement is typical of you.

Strongly Disagree (0)  
Moderately Disagree (1)  
Slightly Disagree (2)  
Slightly Agree (3)  
Moderately Agree (4)  
Strongly Agree (5)

1. I am usually able to avoid threat quite easily.
2. How well I cope with difficult situations depends on whether I have outside help. (R)
3. When I am put under stress, I am likely to lose control. (R)
4. I can usually stop my anxiety from showing.
5. When I am frightened by something, there is generally nothing I can do. (R)
6. My emotions seem to have a life of their own. (R)
7. There is little I can do to influence people's judgments of me. (R)
8. Whether I can successfully escape a frightening situation is always a matter of chance with me. (R)
9. I often shake uncontrollably. (R)
10. I can usually put worrisome thoughts out of my mind easily.
11. When I am in a stressful situation, I am able to stop myself from breathing too hard.
12. I can usually influence the degree to which a situation is potentially threatening to me.
13. I am able to control my level of anxiety.
14. There is little I can do to change frightening events. (R)
15. The extent to which a difficult situation resolves itself has nothing to do with my actions. (R)
16. If something is going to hurt me, it will happen no matter what I do. (R)
17. I can usually relax when I want.
18. When I am under stress, I am not always sure how I will react. (R)
19. I can usually make sure people like me if I work at it.
20. Most events that make me anxious are outside my control. (R)

21. I always know exactly how I will react to difficult situations.

22. I am unconcerned if I become anxious in a difficult situation, because I am confident in my ability to cope with my symptoms.

23. What people think of me is largely outside of my control. (R)

24. I usually find it hard to deal with difficult problems. (R)

25. When I hear someone has a serious illness, I worry that I am next. (R)

26. When I am anxious, I find it hard to focus on anything other than my anxiety. (R)

27. I am able to cope as effectively with unexpected anxiety as I am with anxiety that I expect to occur.

28. I sometimes think, "Why even bother to try coping with my anxiety when nothing I do seems to affect how frequently or intensely I experience it?" (R)

29. I often have the ability to get along with "difficult" people.

30. I will avoid conflict due to my inability to successfully resolve it. (R)

(R) = Reverse scored items
APPENDIX I: LIFE ORIENTATION TEST - REVISED (LOT R)
(Scheier & Carver, 1985)

Please be as honest and accurate as you can throughout. Try not to let your response to one statement influence your responses to other statements. There are no "correct" or "incorrect" answers. Answer according to your own feelings, rather than how you think "most people" would answer.

I Disagree a lot (1)
I Disagree a little (2)
I neither agree nor disagree (3)
I agree a little (4)
I agree a lot (5)

1. In uncertain times, I usually expect the best.
2. It's easy for me to relax.
3. If something can go wrong for me, it will. (R)
4. I'm always optimistic about my future.
5. I enjoy my friends a lot.
6. It's important for me to keep busy.
7. I hardly ever expect things to go my way. (R)
8. I don't get upset too easily.
9. I rarely count on good things happening to me. (R)
10. Overall, I expect more good things to happen to me than bad.

Items 2, 5, 6, and 8 are fillers.
(R) = Reverse scored items
APPENDIX J: ROSENBERG SELF ESTEEM SCALE (SES)
(Rosenberg, 1965)

Below is a list of statements dealing with your general feelings about yourself. Rate your agreement with each statement on the following scale:

Strongly Agree (3)
Agree (2)
Disagree (1)
Strongly Disagree (0)

1. On the whole, I am satisfied with myself.
2. At times, I think I am no good at all.*
3. I feel that I have a number of good qualities.
4. I am able to do things as well as most other people.
5. I feel I do not have much to be proud of.*
6. I certainly feel useless at times.*
7. I feel that I'm a person of worth, at least on an equal plane with others.
8. I wish I could have more respect for myself.*
9. All in all, I am inclined to feel that I am a failure.*
10. I take a positive attitude toward myself.

*Reverse scored
APPENDIX K: MARLOWE-CROWNE SOCIAL DESIRABILITY SCALE
Short Form (Strahan & Gerbaski, 1972)

Listed below are a number of statements concerning personal attitudes and traits. Read each item and decide whether that statement is true or false as it pertains to you personally.

True
False

1. I like to gossip at times.
2. There have been occasions when I took advantage of someone.
3. I'm always willing to admit it when I make a mistake.
4. I always try to practice what I preach.
5. I sometimes try to get even rather than forgive and forget.
6. At times I have really insisted on having things my own way.
7. There have been occasions when I felt like smashing things.
8. I never resent being asked to return a favor.
9. I have never been irked when people expressed ideas very different from my own.
10. I have never deliberately said something to hurt someone's feelings.

Items that equal 1 point if answered true: 3, 4, 8, 9, 10
Items that equal 1 point if answered false: 1, 2, 5, 6, 7
APPENDIX L: LIFE EVENTS CHECKLIST

LEC-5 Instructions: Listed below are a number of difficult or stressful things that sometimes happen to people. For each event check one or more of the boxes to the right to indicate that:

(a) it happened to you personally; (Event Happened to me)
(b) you witnessed it happen to someone else; (Witnessed it)
(c) you learned about it happening to a close family member or close friend; (Learned about it)
(d) you were exposed to it as part of your job (for example, paramedic, police, military, or other first responder); (Part of my job)
(e) you’re not sure if it fits; (Not sure)
(f) it doesn’t apply to you. (Doesn’t apply)

Be sure to consider your entire life (growing up as well as adulthood) as you go through the list of events.

1. Natural disaster (for example, flood, hurricane, tornado, earthquake)
2. Fire or explosion
3. Transportation accident (for example, car accident, boat accident, train wreck, plane crash)
4. Serious accident at work, home, or during recreational activity
5. Exposure to toxic substance (for example, dangerous chemicals, radiation)
6. Physical assault (for example, being attacked, hit, slapped, kicked, beaten up)
7. Assault with a weapon (for example, being shot, stabbed, threatened with a knife, gun, bomb)
8. Sexual assault (rape, attempted rape, made to perform any type of sexual act through force or threat of harm)
9. Other unwanted or uncomfortable sexual experience
10. Combat or exposure to a war-zone (in the military or as a civilian)
11. Captivity (for example, being kidnapped, abducted, held hostage, prisoner of war)
12. Life-threatening illness or injury
13. Severe human suffering
14. Sudden violent death (for example, homicide, suicide)
15. Sudden accidental death
16. Serious injury, harm, or death you caused to someone else
17. Any other very stressful event or experience

Scoring

The LEC-5 is intended to gather information about the potentially traumatic experiences a person has experienced. There is no formal scoring protocol or interpretation per se, other than identifying whether a person has experienced one or more of the events listed. Respondents indicate varying levels of exposure to each type of potentially traumatic event included on a 6-point nominal scale, and respondents may endorse multiple levels of exposure to the same trauma type. The LEC-5 does not yield a total score or composite score.
APPENDIX M: STRESSFUL EVENTS CHECKLIST - 5

Instructions: Below is a list of problems that people sometimes have in response to a very stressful experience. Please read each problem carefully and then circle one of the numbers to the right to indicate how much you have been bothered by that problem in the past month.

Not at all (0)
A little bit (1)
Moderately (2)
Quite a bit (3)
Extremely (4)

In the past month, how much were you bothered by:

1. Repeated, disturbing, and unwanted memories of the stressful experience?
2. Repeated, disturbing dreams of the stressful experience?
3. Suddenly feeling or acting as if the stressful experience were actually happening again (as if you were actually back there reliving it)?
4. Feeling very upset when something reminded you of the stressful experience?
5. Having strong physical reactions when something reminded you of the stressful experience (for example, heart pounding, trouble breathing, sweating)?
6. Avoiding memories, thoughts, or feelings related to the stressful experience?
7. Avoiding external reminders of the stressful experience (for example, people, places, conversations, activities, objects, or situations)?
8. Trouble remembering important parts of the stressful experience?
9. Having strong negative beliefs about yourself, other people, or the world (for example, having thoughts such as: I am bad, there is something seriously wrong with me, no one can be trusted, the world is completely dangerous)?
10. Blaming yourself or someone else for the stressful experience or what happened after it?
11. Having strong negative feelings such as fear, horror, anger, guilt, or shame?
12. Loss of interest in activities that you used to enjoy?
13. Feeling distant or cut off from other people?
14. Trouble experiencing positive feelings (for example, being unable to feel happiness or have loving feelings for people close to you)?
15. Irritable behavior, angry outbursts, or acting aggressively?
16. Taking too many risks or doing things that could cause you harm?
17. Being “superalert” or watchful or on guard?
18. Feeling jumpy or easily startled?
19. Having difficulty concentrating?
20. Trouble falling or staying asleep?
APPENDIX N: ATTENTION CHECK QUESTIONS

1. Following the survival response strategies vignette, participants were checked to verify that they were paying attention to the vignette scenario as they read it:

Previously in the story, the instructor left the room. Where did she go?
   A. To use the restroom
   B. To check to see what the noises were
   C. To record her grades
   D. To a previously scheduled faculty meeting

2. Inserted into the Melbourne Decision Making Questionnaire:

I was the one who decided where my parents would be born.
   True for me
   Sometimes true for me
   Not true for me

3. Inserted into the Anxiety Control Questionnaire

I currently live in the United States.
   Strongly disagree
   Moderately disagree
   Slightly disagree
   Slightly agree
   Moderately agree
   Strongly agree

4. Inserted into the Life Orientation Test:

Which answer below has the most words in it?
   I Disagree a lot
   I Disagree a little
   I neither agree nor disagree
   I agree a little
   I agree a lot

5. Inserted into the Marlow-Crowne Social Desirability Scale:

I am between 18 and 65 years old.
   True
   False
6. Inserted after the Stressful Events Checklist:

Which of the answers below starts with the letter E?

- Not at all
- A little bit
- Moderately
- Quite a bit
- **Extremely**

7. Inserted after the Connor-Davidson Resilience Scale:

Where I live, the sun sets several times a day.

- **Not true at all**
- Rarely true
- Sometimes true
- Often true
- True nearly all the time